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REFLECTIONS ON THE INCREASING MORTALITY FROM TUBERCULOSIS IN WOMEN

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STUDENTS of tuberculosis are much puzzled about the recent increase in the mortality from this disease among women, especially among the younger ones. I have tried to discover an explanation of this phenomenon, so as to be able to suggest some measures that might be of avail to check it. Perhaps my suggestions are more applicable to my own country and to Europe generally than to Canada. They are based upon the experience of the work-shops or industrial settlements that have lately been started for consumptives.

In 1905, Dr. Pattison instituted his most elaborate system of occupation therapy for tuberculous patients in the Frimley Sanatorium. Since then tremendous strides have been made in this direction. Three years ago Warrior Jones came to this country and told you of his admirable organization near Cambridge. Thanks to his enthusiastic initiative and zealous administration this industrial settlement is the most complete and valuable of any that I know. Since the end of the war much has been said and done along these lines, and now such institutions figure largely in every comprehensive anti-tuberculosis scheme.

Nevertheless, if we look into the matter closely, we find that relatively few tuberculous patients can avail themselves of these institutions. In the beginning of this movement it was thought that such colonies would be chiefly useful for early cases—for those patients who are supposed to get practically cured by sanatorium treatment. In the colony such patients, it was hoped, would, little by little, accustom themselves to working again after the long months of rest cure, and acquire the knowledge of a lighter and healthier job, which should be a means of livelihood after leaving the colony. Experience has brought about the total demolition of this beautiful dream. In the first place it has been realized that it is very difficult to teach a new trade to an adult. It is a long, difficult, and troublesome task, and therefore, it is expensive. It doesn't pay. Besides this, for sentimental, financial, and family reasons, this privileged category of patients is drawn towards their former occupations, and their town life. Who remain? Those who have lost all hope of being able to compete with others in life's battle; and for these, institutions such as Papworth are veritably providential. In fact, at Papworth patients are not taught a trade, but they are taught some portion of it. No one of them is able to make a table, but one can prepare the wood, another make a leg, another can put the different parts together, etc. None of them becomes a carpenter; but the carpenter is the sum total of many. The result is that while at Papworth these patients are of some value, outside they are of none.

A plan which is less expensive, and therefore can be more easily put into practice, is represented by the Altro Shop in New York, which completes the scheme of the Home Sanatorium in that city. In this case we see the workshop or industrial settlement coming into the city to meet the individual. The patient continues to live at home, with his family, in his home town. The public health nurse or the visiting nurse attached to his clinic keeps an eye on him, and the tenor of his life is not upset. He goes to his workshop like every other workman, but his

workshop is especially adapted to his requirements and to the state of his health. It has been designed especially for this purpose. As one can see, the advantage is enormous. The daily life of the individual is subject to very little change, and the carrying on of the institution requires a minimum of expense and of energy.

But it must be recognized that these institutions, good as they are, lie outside of ordinary activities. They tend to attract those whose health is seriously impaired—those who are obliged to confess themselves conquered in the battle. It is a pity that it should be so, but so it is. We can only testify to the fact that the post-sanatorial colonies and workshops are a development of a hospital, and not a preparation for active life. Their importance is purely humanitarian. They are worth very little from a prophylactic point of view, and practically nothing as regards powers of recuperation. As you see, we are very far from the beautiful dream which inspired the institution of industrial colonies of which one of their champions wrote:

"Of hardly less importance than eradication and prevention is the restoration to normal citizenship and industrial efficiency of those who have become victims of active tuberculous disease[1]".

The measures against tuberculosis can be divided into two great categories: prophylactic and curative. Between the two there is the same difference as between the rank and file of battle and the medical corps of an army. Allow me for a moment to indulge in cynicism. Is it not so that, when the medical corps did not exist, and when the health of soldiers had but little safeguard, many battles were yet won? The industrial colonies are only important from the prophylactic point of view, in so far as they isolate from contact with the world at large a certain number of contagious cases. Otherwise they are merely charitable institutions, which I entirely admire—but without illusions.

Now it is certain that in the fight against tuberculosis what counts most is prophylaxis and prevention. I think that these institutions could be so modified that they might become powerful weapons of prophylaxis. From belonging, as one may say, to the medical corps, they might well be brought into the line of battle. To make it clear, let us consider for a moment the course of the epidemiology of the disease. As time passes, we are aware that the epidemiology of tuberculosis is subject to appreciable modifications. The causes of these changes up to now escape us, but it behooves us to be informed as to the movements of the enemy, in order to be better able to put up an efficacious plan of defence.

Brownlee (quoted by Coutts, from whom I borrow the following considerations) pointed out that in England and Wales the conspicuous fall in the death rate from tuberculosis between 1851 and 1910 had taken place in the age period from 20 to 25 years. Although the later age periods participated in the reduced mortality it was to a smaller degree. When we come to consider the curves for later periods than 1910 we find that this is reversed, the *later* age periods showing the *greater* decline, whilst for the age periods 15 to 20 and 20 to 25 there is little reduction in males, and *among females the mortality rates at these age periods have actually increased.* It is well recognized that pulmonary tuberculosis at the age period 15 to 25 is apt to be an acute and rapidly progressive disease, not very amenable to treatment. It is disturbing, therefore, to find this failure for this age period to share in the general reduction of mortality in recent years[2]. Almost identical results have been given by the studies which I have made on the subject of the epidemiology of tuberculosis in the city of Florence, for the fifteen years from 1911 to 1925. While up to 1920 the maximum of mortality from tuberculosis is manifested in the male sex, from 1921 on the female sex takes the ascendancy, and from information given me by the statistics office of this city, this higher mortality among women was maintained during the succeeding years. (1926-27-28.) Moreover, in the fifteen years that I have studied the question, the mortality among women is invariably higher than that among men in the first twenty years of life.

In his remarkable study of this subject, Dr. Coutts says plainly that he is not prepared to offer any explanation, or to suggest why female mortality at this age period should have actually increased; nor did I find myself better able to do so, until quite lately I came across a very interesting paper by Von Pirquet. This distinguished physician, whose tragic end was so deeply felt in the medical world, seeks the explanation of this phenomenon in the special physical conditions relating to the allergy of age and sex. He says:—

> While the greater part of mortal disease depends in old age on the natural decay of the tissues, and in infancy on a lack of defensive power, tuberculosis is more dangerous in those years when nature resists thore

diseases more strongly. The most startling proof of this is to be found in the statistics concerning women: during the 20th year, tuberculosis is the cause of more than half the total number of deaths. This gives us a clear example of the allergy of age and sex.

The reacting power of the lungs against the bacillus of tuberculosis changes during the period of puberty. At an early age in girls, and somewhat later in boys, there is a period when the lungs are easily attacked by the bacillus of tuberculosis. While before this period it is rare to find large colonies of bacilli in the lungs, during the critical period the lungs may easily become the seat of infection, causing danger to life.[3]

It is common knowledge, not only among doctors but also among lay people, that the age of puberty is a dangerous turning-point in the life of a girl. It is also an age producing great strain and when life's difficulties begin to make themselves felt. It is the time when feelings of sentiment are most intense, and the material necessities of life assert themselves imperiously, and this heavy task falls upon a frail body which is hardly more than that of a child. According to varying social conditions, educational duties become more intense; work is taken up in factory, workshop, or office; families often look for some financial aid in the domestic ménage from these young wage-earners, or it may be that social life is entered upon. In all classes of society, life's rhythm becomes accelerated and intensified.

A woman certainly enters into active life under the most unfavourable conditions. This occurs when her resisting power is at a low ebb. The increasing strain in our modern life, and the ever greater number of girls who at an immature age are obliged to support themselves, give a plausible explanation of this indisputable fact, that women manifest the greatest death-rate from tuberculosis in their first twenty years. Parisot and Saleur have found 85 per cent of positive reactions among children of the age of five living together with a tuberculous person. But among 723 children taken from immune surroundings, they found 34 per cent of positive reactions. These last appear between the 10th and 15th year of age, and are evidently infections from outside. It is not too much to hazard a supposition that a like percentage of children of the first category at the critical period between ten and fifteen are likely to be exposed to a new infection. Now, the line of antituberculosis defence, which starts from early infancy and stretches out as far as life's end, shows a weak point just at the age of puberty. In some countries it is entirely interrupted. At this critical period, when we have to confront the maximum of danger, our antituberculosis schemes offer the minimum of protection.

We have been told so often that tuberculosis is contracted during infancy, that we tend to act as if it was a disease of childhood, worse still, a family disease, and we do not consider enough the possibility of infection from the outside. At the age of puberty this outside infection is most to be feared. I hope I make myself clear; I don't want to minimize in any way whatever the importance of the protection of young children from this infection. What I say is that there is a second dangerous moment in the child's life, and this is when he is in his "teens." Sanatoria, industrial settlements like Papworth, and workshops like the Altro Shop, hold the defensive line at the later period. At the earlier one we have maternity centres, child welfare stations, open air schools, preventoria, day camps, etc. Convalescent homes provide for those who need a short rest in order to make a quick recovery. But what can we do for those who find themselves handicapped when their childhood is just over, at the beginning of their active life? If only they were tuberculous, then we would have the resource of the sanatorium, but what if they are just on the verge of it? And this is always the case at a certain moment. The example provided by the post-sanatorial colonies may give us some suggestions. All that has been said in favour of these institutions for tuberculous patients would apply equally to those which might be established for those not yet tuberculous.

When a doctor says to his rich patients who have come to consult him on behalf of a girl who is anæmic, overgrown, poorly developed, weak, and nervous: "You must be careful. Take her to the country, give her plenty of rest, or open air exercises," this same doctor should have at hand an institution where he could send girls of the poorer classes who are in like condition. The open-air school is no longer available; the girl is past the age for it. Day camps and summer holidays are not sufficient. The crisis is a long one; it may last for years. No one can afford to spend such a long time thinking solely of one's health. If in these years physical health is built up, social and moral life is also better entered upon. At this time a man chooses the path which he will follow during his life. He stores up the knowledge and the intellectual and physical habits which will form the capital upon which he will draw. Up to this time he has accepted the ideas and judgments which have come to him ready made by preceding generations. Now he begins to form his own conscience and point of

view, which, in turn, will serve as characteristic of his generation. This period is therefore the most important in the life of an individual, and also it is of the greatest importance in the history of the human race.

Together with physical health we must, for the individual, as for the race, preserve self-respect, dignity, and the initiative spirit. We must foster the love of effort, of work, and of physical and intellectual activity. Social values are as important as physical, if not more so. Mankind is a complex of these two values. This fact is so true and so much appreciated that we find it expressed in every age, long before notions of hygiene and psychology had become common knowledge to all people, in such utterances as,—"A man," "to be a man," "to make a man," and here by man is meant "homo sapiens," which term includes woman as well.

All that has been said in reference to industrial colonies and workshops, regarding the treatment of positively tuberculous patients, can be repeated here with an addition. In the case of recognized tuberculosis the colony represents an artificial industrial world, adapted to the patients' reduced efficiency, just to give them the illusion of thinking that they are leading a normal life, even if they are outside its reality. By adapting these institutions to those who are not yet tuberculous we could form a preparatory school for real life, from which the pupils could come out as they do from the industrial or vocational schools and colleges, prepared in body and mind for the battle of life, valid collaborators in the common welfare. Medically speaking, we could say that post-sanatorial colonies are *passively* prophylactic, in so far that they eliminate from society contagious cases, while a pre-sanatorial colony is *actively* prophylactic, in so far as it provides against the manifestation of the disease.

In the industrial settlement of the type of Papworth all work is disintegrated into its component parts, to allow of each part being rapidly learnt and accomplished by patients of mature years, or, as in the Altro Shop, where all work is of the simplest character (sewing, etc.), for the same category of patients. In pre-sanatorial colonies we should be free to adopt all kinds of work; indeed, we should choose the greatest possible variety of occupations, to fall in with the requirements of vocations, tastes, and needs. That will make a specialized vocational school for the weak adolescent in the same way that the open air school provides for the weak child. In the open air schools the delicate child is offered cultural opportunities such as are enjoyed by his contemporaries in an ordinary school. He is not therefore handicapped when at the expiration of some years he enters ordinary life. This is the spirit which should guide us.

Open air schools bring the child to the age of puberty. The institutions which I would propose to call "Country Vocational Schools" would take on the child where the open air school leaves off. Or, it could take charge of yet another category, those who in early years were fairly strong but whose strength deteriorates as they enter another period. All these could be helped along and protected through the difficult epoch of puberty—difficult, because it is the most insidious; difficult, because soul and body are involved; difficult, because it does not kill. Those who fall remain wrecks for years, and only much later death comes after years of suffering and many humiliations. All this is the meaning of that "statistic" phrase of Von Pirquet's, "Tuberculosis is the cause of fifty per cent of deaths among women in their twentieth year." And this we must prevent.

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A SERIES OF TYPHOID FEVER CASES INFECTED PER RECTUM.—The epidemiology of typhoid is so generally understood that the tracing of the causative factors in outbreaks is ordinarily a routine matter. Isolated cases and some small group outbreaks do not lend themselves to complete analysis as to the causative factors. Too often, perhaps, the field investigator is inclined to regard these single cases and small group outbreaks as due to the carrier without ever being able to establish the facts. Cases are regarded as part of the normal expectancy or of the so-called irreducible minimum. Contact typhoid usually manifests itself so definitely that one can readily determine the method of transmission of the disease. A rather bizarre and not unlikely method of transmission of typhoid was recently reported by Hervey. Thirteen cases of the disease occurred in a hospital and were found to be due to the practice of using the same drip apparatus interchangably between patients without sterilization. The original source was a patient who developed typhoid on the fourteenth day after admission to hospital. Nurses and other employees gave negative results in laboratory examinations. This somewhat fortuitous outbreak is another indication of the importance of every reasonable precaution to prevent contact of patients with infection, whether personally or directly or through inanimate objects. Fortunately, typhoid contracted in hospitals is practically a relic of the past.—C. R. Hervey, *Am. J. Pub. Health* **19**: 166, 1929.

OBSTETRICAL PRACTICE YESTERDAY AND TO-DAY*

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IF I were able to scan the future as clearly as I can recall the past the title of this paper would read:—Obstetrical Practice Yesterday, To-day and To-morrow, and it might prove an interesting and illuminating study. It is forty years since I conducted my first maternity case. I see much of present-day obstetrical practice and know much of its shortcomings. For four decades I have been profoundly interested in this work; have always considered obstetrical practice of premier importance and I should like to see, before I close my record, its conduct placed on a much higher level than it occupies to-day.

A glance at maternity and infant mortality statistics should convince even the casual observer that there is something wrong with present day methods. Why are the lives of so many mothers sacrificed during labour? Is a large part of this mortality preventable? Day by day babies are being brought into the world dead, or survive only a few hours. Is there needless sacrifice, and if so, where rests the responsibility?

It is my hope that this paper, written from a somewhat full experience, may serve to correct a few of the errors into which medical men, and more especially the beginners, are prone to fall. If my views help to create a keener interest in this important work and thus bring a little nearer the ideal for which all are striving, I feel I shall have accomplished something worth while.

"The obstetric ideal demands that the mother should pass through labour without injury to herself, and that the babe should be born healthy and capable of normal growth and development physically and mentally." The failure to approximate, even remotely, that ideal is the tragedy of obstetrical practice to-day. In my library there is a work published in the year 1782 by Dr. John Buchan of London, England, from which I quote these words:—

"Although the management of women in childbed has been practiced since the earliest accounts of time it is still, in most countries, on a very bad footing." One hundred and thirty years later Professor Joseph DeLee, of Chicago, made this startling statement:—"It is generally conceded that the practice of obstetrics is on a low plane." Only five years ago Prentise Wilson of Washington, wrote:—"The rate for deaths of infants, attributable to birth injury, has been steadily climbing upward over a considerable period of years." My own experience has convinced me beyond any doubt that the tide is still rising. What Buchan said of the practice of obstetrics in the closing years of the eighteenth century would hold equally true in regard to medicine and surgery. DeLee's statement, however, over a hundred years later, could not be applied to the practice of medicine and surgery, for it is everywhere conceded that this is on a very high plane.

The question for every man practising obstetrics to-day, is: are these statements true? And if true, in what degree am I responsible?

It may be said without fear of contradiction that the medical profession, speaking generally, entertains very unsound and dangerous views as to the importance of this branch of surgical practice. The average practitioner regards pregnancy and childbirth as strictly physiological conditions. He knows a majority of women pass these periods in safety, and always anticipating that each new patient will prove to be one of this majority, he is blind to the dangers the minority have to face and is often ill prepared for the emergency confronting him. The practice of obstetrics would rapidly attain to a higher level if medical men would take to heart Mauriceau's dictum that "Pregnancy is a disease of nine months' duration." If our sole concern is with the actual births we have altogether misinterpreted the meaning of the word obstetrics.

What is obstetrics? Hirst's definition is all embracing: "It is the study of the physiology and pathology of conception, gestation, parturition and the puerperium with all the complications and pathologic consequences of the child bearing act at all periods."

A child has a fall and shortly develops headache and becomes restless and feverish. The mother naturally attributes these symptoms to the accident, but very soon examination by the

* Paper given at meeting of District 1, Registered Nurses' Association of Ontario.

physician discloses the fact that the patient is suffering from tuberculous meningitis. The fall proved to be only an incident. So likewise, childbirth is but an incident in the great reproductive cycle. We concentrate on it alone and fail to discover the menace that is threatening two lives. Three to five per cent of children die during labour and many are permanently crippled. Fifty per cent of women who have borne children carry the marks of injury and many date a life of permanent invalidism from the birth of their first baby. How much of the traumatism of labour are we responsible for and how much of it could be avoided if we had a truer conception of the importance of obstetrics? If one were to make the remark in an average company of medical men that he had a special liking for obstetrical practice, the statement would evoke a variety of responses. Some would commiserate, some condemn, a few only would commend. The attitude of the medical man is precisely the attitude one would expect the laity to assume, and one finds it altogether too common in our best hospitals. To many medical men obstetrical practice is sordid, drab, uninteresting, and unremunerative. Their views unconsciously permeate and infect hospitals. The more scars and patches a pair of gloves discloses, the more certain is that pair to find its way to the obstetrical ward. They are not fit for the surgery, but anything is good enough for the labour room. My own view is that no other work a physician engages in can equal in importance and genuine satisfaction the task of bringing healthy children safely into the world. It is a regrettable fact that so many men practising obstetrics to-day are indifferent to the claims of the lying-in room and a good many known to me have a positive dislike for the work. And still they carry on, the rush of twentieth century competition, the compelling factor.

I am thoroughly convinced that the theory of obstetrics is skilfully taught in Ontario, but all will agree that facilities for teaching the practical, and most important side of it are as hopelessly inadequate now as they were in my student days. With imperfect practical training, new men year by year face difficult obstetrical problems, with a supreme confidence in beneficent nature, which fortunately in so many cases proves equal to the occasion. They promptly refer an eye case to the specialist in that field, but have no hesitancy in assuming charge of a mother in a great crisis where two lives are involved, with little knowledge of the attendant dangers, and utterly lacking the practical skill which alone will meet the emergency.

Men have told me frequently that they have a positive abhorrence of obstetrics. I naturally wonder why they carry on. Would scores of great surgeons one could name have reached the eminence they occupy to-day with such signal benefit to the human race if surgery had not appealed to them? Would the discoverer of insulin have been able to bless the world with his inestimable gift if he had developed a distaste for research work? The answer is obvious. The physician who dislikes obstetrical work and still practises it is not playing fair with posterity.

Until recently, obstetrical fees offered little encouragement to the physician willing to specialize. Even to-day, with largely increased fees, the obstetrician is still, proportionately, very inadequately paid. How many times I can recall taking charge of a toxic case and after infinite watchfulness and unremitting care bringing mother and babe safely through. I remember, too, my fee for that period of stress amounted to anywhere from a third to a half of what my surgeon neighbour received for an appendectomy. At the same time I feel constrained to sound a warning. The burden of raising a family in some of our larger centres of population is a colossal one, and many young couples will inevitably try to shirk the responsibility. With hospital, nurse and doctor's fees totalling one-third of the family income how many times is this family going to repeat? Few people nowadays can afford to die. Is the time approaching when prohibitive obstetrical fees will affect the birth rate? If ideal fees stood always for ideal obstetrics there would be little ground for complaint. But do they? Just why is "A" living in a large city, able to demand six times the obstetrical fee "B" in a small town gets, when "B" has six times the practical experience of "A" and is much the safer man in any crisis?

In what respects is obstetrical practice to-day superior to that of forty years ago? I have in my office records the history of nearly 5,000 maternity cases. A retrospect of the decades that have passed since I began practice, together with a study of these histories has convinced me that, at least in some respects, the profession is making progress. Our aseptic technique, while by no means perfect, is steadily gaining a higher degree of efficiency. For instance, in instru-

mental delivery and in the conduct of podalic version we do not, and should not, leave the preparation of the field entirely to the nurse, but as a preliminary to the operation the vagina is thoroughly and systematically cleansed with liquid soap and sterile water from the cervix to the vulva by the doctor himself. In addition to sterilizing the parturient canal, we obtain, through personal attention to this matter, the gentle and gradual dilatation so essential to a safe completion of the operation.

There is also a growing belief in fewer vaginal examinations. Experience has demonstrated that nearly all information as to position and progress can be ascertained through abdominal palpation alone. I confess to a change of heart in regard to vaginal douching following childbirth. I once thought that such practice was attended with too much risk to be undertaken only in extreme cases. Is there any good surgical reason for permitting fetid vaginal discharges to pour over lacerated or abraded surfaces? In such cases repeated douches of lysol, boracic or even plain sterile water will not only cleanse the field but will hasten the process of involution, and what is of almost equal importance will add materially to the patient's comfort.

Then, too, the question of allowing maternity cases to sit up has long been a debatable theme. My own practice is to permit every normal case the back rest on the second day, and to sit in a chair for a few minutes as early as the eighth. I have no doubt many would make a speedier convalescence were they allowed out of bed even earlier. This practice assists normal drainage immensely. Inadequate drainage predisposes to subinvolution, and subinvolution fosters serious malpositions of the uterus. Keeping normal maternity cases in bed for 14 days is a practice with few exponents to-day. The rise of the trained nurse, who was practically unknown in my early days, has had a most beneficial influence in making for better maternity practice. Her presence at the bed side is a stimulus to more careful, and consequently more successful work.

The broadening of the field for the Cæsarean operation, saner methods for preserving the integrity of the maternal passage; the growing belief in, and the immensely extended practice of prenatal care; the more general use of anæsthesia to which every woman in labour is entitled; the practical abandonment of the high forceps operation for the safer method of podalic version, and, I might add, the introduction of pituitrin; these are a few of the more important advances made in the practice of obstetrics since 1890. But the ideal is still a long way from being realized.

May I be permitted to point to some of the more glaring examples of obstetrical inefficiency one sees to-day on every hand. How often do medical men send patients to hospital without knowing the lie of the child; without a thought that there might be serious disproportion between the passage and the passenger; without having made pelvic measurements; without a single examination of the breasts, and not a thought that in the great reproductive cycle lactation should follow parturition; and with no clear knowledge whether the patient is a month ahead of schedule or two weeks behind? The nurse reports the patient's admission and the usual preparation is ordered. Questions are asked about the character of the pains and the discharge, if any, and the nurse is instructed to call the doctor when needed. The latter dismisses the patient from his thoughts and proceeds with a more interesting and more profitable routine of practice. The nurse, careful to avoid the error of summoning the busy doctor too soon, waits for the "bulging" which in so many instances is pitifully slow in making its appearance. Then when an exhausted patient, worn by hours of perhaps needless suffering, insists on his attendance he finds he has a dead baby on his hands. Too busy; not sufficiently interested; and a life sacrificed. *The exigencies of general practice have always been and always will be a menace to good obstetrics.*

Vaginal examination reveals a normal presentation with fair engagement and a soft and dilatable os. Hours later, a second examination shows no progress, in spite of regular and severe pains. The physician who still persists in temporizing under these conditions is making a mistake which may have tragic consequences. The simple separation of adherent membranes will solve the difficulty often, and should have been done hours before. Or a misplaced arm may be the obstacle as I have frequently found. A simple podalic version offers a safe detour, provided, of course, there has not been too much delay.

Candidly I feel that more fatal errors have been made by waiting for this so-called physiological act to complete itself than through premature attempts to deliver. Everyone knows that mistakes are daily being made in both

directions. Certain cases demand much more time than others for safe completion, a fact which is being constantly lost sight of. I have seen repeated unsuccessful attempts at delivery in a face case result in the baby's death, when without interference of any kind that mother would have delivered herself of a living child. Breech, face, occipito-posterior cases, those in which there has been premature escape of the amniotic fluid in normal presentations, are extremely trying to both patient and physician. In such cases after the diagnosis has been made the patient should be informed that owing to the rather uncommon lie of the baby the case will demand more time but that eventually all will be well. Secure the mother's confidence and co-operation and the item of extra time can be discounted. Under these circumstances the physician is not likely to be stampeded into taking risky premature action, owing to the importunities of relatives and interested friends.

My advice to young men faced with these problems is to ask for a consultation early. They should be willing at all times to recognize their limitations, and ask the assistance of some man whose wide practical experience warrants an opinion worth while. Not long ago I was asked to assist a young man complete a version he had undertaken at my suggestion. His attitude afterwards seemed almost one of chagrin to think that any sort of emergency should arise where he had to have assistance. In my first 1,500 cases I had assistance in only one. I am not particularly proud of the record and never boast about it. I was practising many years before the physician I have mentioned was born and I still welcome advice, knowing I have still much to learn.

Although the profession has made great progress in the so essential matter of pre-natal care there is still much to be done. Every period of the reproductive cycle demands our attention—the neglect of one may spell disaster. The physician may have been scrupulously exact in his directions as to diet, exercise and elimination. He may have recorded blood pressure regularly and accurately. He may have made frequent and careful urinary examinations and yet have overlooked one essential, the importance of which so few men recognize. I have had patients sent to me for confinement where every detail I have mentioned had been observed and yet when the time came to put the baby to the breast a nick was found where there should have been a nipple. That meant a block in the cycle with the important function of lactation side-tracked and artificial feeding with its attendant risks inaugurated. Why not adopt a routine and zealously carry it out? Efforts to build up nipples and prevent development of fissures are surely worth while. And yet the average physician scarce gives a thought to this subject. These same men would find no place in their practice for a mucus catheter or an umbilical clamp. Many years ago I showed a traveler for an instrument house a mucus catheter I had purchased in Dublin. He interested his firm in its manufacture and the instrument was placed on the market, but there was no sale. The profession was not interested. A graduate of the Rotunda would not think his equipment complete without one, thanks to Tweedy's teaching. Everyone knows why silver solution for the eyes of a new born babe is made a routine. If a child draws infected mucus into its lungs with its first inspiration what is likely to happen? If this mucus can be quickly and safely removed why is it not done?

If the umbilical clamps now so easily obtained are a distinct improvement on the tape method—and they are—why are they not more commonly used? Always the one answer—anything will do for a maternity case. Many physicians have no use for an abdominal binder; they say it serves no useful purpose. If it affords the patient a degree of comfort it should be applied nevertheless. The man who overlooks the binder is very likely to overlook many other essentials.

The "after pains" that make the life of many mothers a nightmare for several days are often dismissed as a necessary infliction assigned by the Almighty for the patient's ultimate good. If the doctor who so lightly regards these pains were to suffer in the same degree himself he would howl his head off. If he would order the nurse to give 1/6 to ¼ of a grain of morphia hypodermically the moment these pains began, he would be surprised to find in how many instances his patient would be permanently relieved. What so many fail to realize is the fact that after pains grow in severity if not relieved immediately.

I have frequently asked students up for examination on obstetrics if they could explain why the rhythmic contractions that follow expulsion of the placenta and cause no twinge of pain as a rule after the first labour should bring almost unbearable suffering in a subsequent accouche-

ment. Needless to say I have never received a satisfactory answer and have never seen it satisfactorily explained in any work on obstetrics.

One of the most difficult problems that confront medical men is to learn the true value of pain. Not long ago a young man whose wife was in labour at the time asked me if men ever suffered pain for pain with their wives, declaring that every time his wife complained he suffered correspondingly. I told him that during a long practice I had known a few such instances but assured him the male pains invariably disappeared before the expulsive stage was reached.

The dangers that lurk along the pathway of the pregnant woman are legion. Always, she is traveling "close to the border-land of pathology" and she needs a guide familiar with every shallow and quicksand and portage along the way. When a young woman consults me with a view to engaging my services in her confinement, I always assure her that it is necessary to live a normal life, to pay particular attention to the bowels and kidneys; to drink freely of water, to eat plenty of nourishing food; to exercise daily as she had been accustomed to and to report to me at 6 months when I would assume complete charge during the balance of her pregnancy. To lay down hard and fast rules as to diet and sleep, the patient to remain in bed to a certain hour on certain days and to eat only what the doctor sees fit to prescribe, when she is only two months pregnant and has no complications of any kind, savours of cheap comedy and often lays the foundation of serious trouble for both mother and child. That sort of advice seldom comes from men of wide practical experience. It always sends the expectant mother into a nervous state that bodes ill for the future of her own life and that of her baby. I cannot too strongly condemn these methods, which are all too frequently employed.

I have always made it my endeavour to enlist the patient's complete co-operation. After pointing to the danger spots, I show her the detour. I prescribe a nipple lotion which she has to apply night and morning, drawing the nipple out to its limit and accustoming it to touch. If a primipara, I advise her always to massage the abdomen each night for the last six or eight weeks with olive oil, assuring her such practice will help bring back muscular tone after the baby comes and prevent that laxity of the abdomen which is so abhorrent to women in general. This occupies the patient's time and encourages her to think she is paving the way to a successful delivery. Frequent urinary examinations, careful blood pressure readings; abdominal palpation to ascertain the presentation and relative size of the child; and your patient will approach her confinement with serenity of mind and a great confidence in the physician in charge.

As I have already mentioned, wonderful advances in the perfection of the Cæsarean operation have been made during the past forty years. While this operation has been unduly exploited, it is nevertheless the only solution in many obstetrical emergencies. In every centre where hospital facilities are available it is being done, and in scores of instances without a shadow of reason or justification. For instance, in one city where two hospitals have been in operation for 35 years, the first Cæsarean section for contracted pelvis was done in March, 1918. The record to date reads 60 Cæsarean operations with a maternal mortality of 6 and with 15 dead babies. As one of the main reasons for this operation is to save children this record will bear investigation. The ease and facility of the performance of Cæsarean section has tempted a number of surgeons to do it, simply because others were doing it. This is a bold and ugly statement, but true. If Cæsarean sections were performed only after consultation, there would be much fewer done and with better results.

I think Cæsarean section is positively indicated in all cases of placenta prævia in elderly primiparæ. It matters not whether the situation is central or marginal. Done immediately the diagnosis is made it means the salvation of two lives, whereas attempts to deliver by vagina would mean the almost certain death of the baby, and serious injury if not worse, for the mother. Any woman 45 years of age and pregnant for the first time should always be given her choice, after the dangers and difficulties of ordinary labour have been explained to her. Cæsarean section offers safety for both mother and child. This is my firm conviction, in spite of having delivered safely in the ordinary way a number of women over that age.

Although some authorities insist that Cæsarean section is never indicated in eclamptic or pre-eclamptic toxæmia I feel the statement is too sweeping. We meet with rare cases where, I am convinced, no other procedure will save two lives. But the fact remains that the vast majority of toxic cases can be successfully treated by less heroic means.

I have long made a practice of inducing labour where prolonged and energetic efforts at elimination had failed to lower blood pressure or reduce the quantity of albumin. After 34 weeks, or even earlier, the child runs much less risk from the menace of prematurity than from continued residence in the uterus of a toxic mother. My method of induction is as follows:—After the vagina has been prepared and with the patient anæsthetized I steady the anterior cervix with a tenaculum, and introduce 3 solid French bougies, size 24, between the membranes and uterine wall. These bougies are placed wholly *within* the uterus and the vagina is lightly packed with gauze. In many instances, pains are induced inside of 2 or 4 hours, but always within 24 hours. The bougies are nearly always expelled before the child but occasionally they come with the placenta and on one occasion I removed the third bougie after the placenta was born. This is a minor detail. I have never had occasion to try any other induction method, so uniformly safe and successful have the bougies been in my hands. Let me repeat, the main contributing factor to the success of this method is placing the bougies entirely *within* the uterus.

Forty years ago anæsthetics were employed in obstetrics only to a very limited degree. To-day it is generally conceded that all women in confinement are entitled to the relief anæsthesia affords. The anæsthetic I have always employed is chloroform, and not in a single instance where I have used it have I seen any untoward effects. Very little is required for any operation such as version or forceps delivery. It is not distasteful; is exceedingly prompt in its action, and nausea and vomiting rarely follow its administration. I employ it in every normal case when the head is passing the perineum, making the anæsthesia complete when the head is sufficiently low to be under my control. Not only does the patient suffer no pain but the complete relaxation enables the physician to save a perineum that might otherwise suffer laceration.

The judicious administration of pituitrin has been a great boon to women in confinement. Much has been written about its use and abuse, and everyone knows it has been frequently employed with sinister results. But like the Cæsarean operation, it will continue to hold an important place in obstetrical practice. With the os fully or almost fully dilated and soft there is no contraindication to its employment. Immediately after its administration chloroform anæsthesia should be started. The mother in nearly every case sleeps peacefully through the delivery and is saved hours of suffering. I always use 1 c.c. at a dose, a too pronounced action being easily controlled by deepening the anæsthesia. It has been frequently urged that its action predisposes to retention of the placenta. My own experience has taught me that the exact opposite is true. The now rather common practice of ironing out a rigid perineum is, of course, not new. I used it regularly thirty years ago. But because of its more general use it marks some advance over older methods.

High forceps operations have now been practically abandoned, podalic version, which is safer, having taken its place. In one of my cases a few years ago, I discovered, on examination, an impacted face presentation. Under chloroform anæsthesia I corrected the position and delivered with forceps. Two years later I found exactly the same condition in the same patient. This time, however, instead of converting the position and using instruments I did a version and delivered a healthy baby in one-third of the time it took in the first instance. Since then I am finding less and less use for forceps and doing more and more versions.

The Rotunda method of delivery in placenta prævia centralis I cannot too highly recommend as a very distinct improvement in the treatment of this dangerous complication. Two fingers are pushed through the centre of the placenta and a foot is reached; a bullet forceps is applied to the ankle, version completed and the foot brought down through the breech in the placenta. A tape is placed about the ankle, gentle traction made from time to time to control hæmorrhage, and the case is left to nature. I know one Rotunda patient who delivered herself of a living baby exactly eight hours after a version had been done as I have indicated. The operator had, in his manipulations, separated so little of the placental attachment that life throughout eight hours of labour flowed uninterruptedly to the child. In my own practice I have succeeded in delivering three living babies in the same way when the placenta was located directly over the os.

But in spite of these advances DeLee is right. Obstetrical practice is on a low plane. Maternal and child mortality is shockingly high. Children are being lost through premature and injudicious efforts to deliver, and many more go out daily

through failure to offer help in time. Attempts at forceps delivery before moulding has taken place; the administration of pituitrin before dilatation; failure to do an episiotomy, and thus facilitate the birth of the head in a breech case, are some of the errors that spell disaster for the baby—subdural hæmorrhages, tears of the tentorium, convulsions and a dead baby twenty-four hours more or less after birth. Then on the other hand, if there is complete dilatation of the os why should precious hours be wasted, waiting for spontaneous delivery? If the head is on the perineum, with the scalp showing at each pain, and the mother too physically exhausted to push it through, what earthly reason has the physician for further delay?

Looking back over forty years of strenuous practice I can say without egotism that my record will bear inspection fairly well. At the same time it might have been much better had not the importunities of a general practice discounted my best efforts. What then is the remedy? We will never see obstetrical practice raised to the plane it should occupy until it is done by trained specialists. There are about 90 per cent too many men in obstetrical practice to-day to look for ideal results. I am acquainted with a number of men willing to devote the remainder of their lives to this specialty, but their aspirations cannot be realized, because, lacking the co-operation of their fellow practitioners, the venture from a pecuniary standpoint would prove a failure.

Let me quote in this connection the words of a great American obstetrician, Longaker, who believes in the "ultra-ultimate specialization of this branch of surgery." "A small number of young men will train under a master and in a reasonable time will become experts in diagnosis and manipulation. In their earliest years these men will have acquired the proper use of their hands in the kindergarten and not necessarily on the gridiron. They will control the obstetric practice of their various communities—and the death of a mother during or after labour is going to be an almost unheard of accident." And should the obstetric specialist take the place the great importance of his work entitles him to, who shall say that before the middle of this century some expert, now a student in training, may not be able to write in the preface to a great book:—"The practice of obstetrics in Canada can now, without question, be said to be on a high plane."

TRAUMATIC RUPTURE OF THE BLADDER AND URETHRA*

A REPORT OF THIRTY-SIX CASES FROM THE DEPARTMENT OF UROLOGY, ROYAL VICTORIA HOSPITAL, MONTREAL

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THE successful treatment of extensive injuries to the bladder and urethra is one of the outstanding achievements of modern surgery. Such cases were the despair of the older practitioners, and the undisputed aphorism comes down from Greek antiquity "No case of injury to the bladder ever recovers." In the *Surgical Reporter* of 1861 we find the first record of a successful operation. It was performed by Dr. A. G. Walther[1] of Pittsburg in 1859. The patient was a blacksmith, 22 years of age, who in a fight was kicked in the abdomen. As a result he had strangury with intense abdominal pain and inability to urinate. Dr. Walther could get no support from his consultants, so, on his own responsibility, ten hours after the injury, he operated, making a median incision from umbilicus to pubes. When the accumulated urine had been carefully sponged out of the abdominal cavity a rent two inches long was found in the fundus of the bladder. To use his own words "The cavity of the abdomen having been cleansed of this noxious agent, the wound of the bladder was left to itself." The abdomen was closed with silver wire without

* This investigation is part of the research work conducted under the terms of the George Christian Hoffman Fellowship of Queen's University, Kingston, held by the author.

drainage. The patient made an excellent recovery, with a retention catheter for two or three weeks.

In 1878, Bartels[2] made an analysis of 504 cases of vesical injury. This report has been generally accepted as a summary of the situation existing before the advent of modern surgery. In the majority of cases the bladder was drained by an indwelling catheter and no operative procedures were attempted until late complications resulting from extravasation occurred. In 131 of these cases the injury involved the peritoneum and every case but one died, that case being the one cited in which Dr. Walther performed a laparotomy. The total mortality for the series was 45 per cent.

Ten years later we have the first report of a case in which the bladder was sutured. This was a case in every way similar to that of Dr. Walther's. Laparotomy was performed, the peritoneal cavity being drained, the bladder sutured and drained by urethral catheter. The patient made an excellent recovery. To Dr. H. H. Grant,[3] of Louisville, Kentucky, belongs the honour of this achievement.

From that period on there are scattered reports of favourable results. But such cases were phenomenal, and even at the beginning of the present century the mortality was almost 50 per cent. Few had the courage to publish a series of cases, because of the bad results.

When we compare present day results with those of Bartel's, or even with those at the beginning of the present century, we realize the achievements of modern surgical methods. The improvement, in our opinion, is the result of early and adequate drainage as a substitute for expectant treatment and conservative surgery.

In this series we shall review, briefly, the common types of injury, the pathology, the clinical features, the principles of treatment, and the immediate and late results.

TYPES OF INJURY

As the urinary organs are in a relatively protected position, injury to them is not so common as injury to other parts of the body. In our series the most common cause was the so-called "straddle" fall; ten cases (27.7 per cent) were the direct result of this injury, while three cases (8.3 per cent) resulted from other falls. White and Martin[4] report a large series with 80 per cent resulting from this injury. Sterling[5] emphasizes automobile accidents as an increasing factor and he reports seven cases in which four resulted from this cause. In our series, however, are only two such misfortunes (5.8 per cent), both men being hit by trucks. Crushing injuries to the pelvis, with fracture, most commonly through the rami of the ischium or pubes, were responsible for seven (19.4 per cent), and in most instances both the bladder and posterior urethra were damaged. In these cases the urethra is commonly injured at the apex of the prostate, just above the triangular ligament, it being "sawn" across by the force of the original violence transmitted through this fixed ligamentous structure. In the one female case in this group, although the pelvis was badly fractured and the bladder extensively lacerated, the urethra by virtue of its loose attachment remained intact.

While fracture of the pelvis not infrequently occurs without injury to the bladder the possibility of it must be kept in mind. As soon as a diagnosis of fractured pelvis is made the integrity of the bladder should be investigated, as rupture may have occurred although the symptoms might not have appeared until hours later, when intraperitoneal extravasation or other complications would lead one to the diagnosis after a loss of valuable time.

Surgical instrumentation was the etiological factor in six cases (16.6 per cent). These were all serious and all had previous strictures. In five cases the surgeon was the culprit and in one instance the patient. In one case the sound had left the urethra at the apex of the prostate and passed up between the capsule and the gland practically enucleating it. This number reflects no great credit on the respective surgeons, and emphasizes the necessity of infinite caution and gentleness in the passage of instruments. We have all noted patients in whom an inflammatory stricture has been converted into an extensive traumatic stricture, and in some instances the ends of the urethra have been separated an inch or more. Four cases (11.1 per cent) were caused by blows about the perinæum and four were the direct or indirect result of childbirth. In many cases the injury had occurred to workmen at their

daily employment, and when one considers the long period of hospitalization and subsequent disability the seriousness of the industrial aspect becomes apparent.

The female urethra, occupying as it does a protected position, and being loosely fixed to the vaginal wall, is rarely injured from without. Then, too, occupational hazards, as compared with those involving men are negligible.

SUMMARY OF CAUSES:

Straddle falls	10	27.7 per cent
Crushing injuries to pelvis	7	19.4 " "
Surgical instrumentation	6	16.6 " "
Blows to perinæum	4	11.1 " "
Childbirth	4	11.1 " "
Other falls	3	8.3 " "
Auto accidents	2	5.8 " "

The following table is given by Peacock and Hain:[6]

Crushing injuries	46.4 per cent
Straddle falls	17.8 " "
Other falls	14.5 " "
Blows	10.7 " "
Surgical misfortune	7.1 " "
Chemical irritation	3.5 " "

PATHOLOGY

These injuries may be roughly divided into two types: (1) Those occurring in front of the triangular ligament. (2) Those of the posterior urethra, often associated with injury to the pelvis when the prostatic urethra and vesical neck are involved and the injury is intrapelvic.

The actual injury may vary from an abrasion of the mucous membrane, or a tear of the muscle wall, to a complete transverse separation with wide retraction of the ends and contraction of the mucous membrane, the intervening space being filled with blood clot. The skin is seldom torn except in cases of very severe injury, when the urethra may be actually pulped or the wall of the anus torn. We shall report one such case in detail.

When the full bladder is ruptured by a fall it usually occurs on the opposite wall, intraperitonally, extraperitonally, or both, and extravasation occurs into the peritoneum and extraperitonally. When however the rupture is associated with a fractured pelvis or a gunshot wound it is more commonly anterior and the extravasation extraperitoneal. The course of the extravasation of the blood and urine, and hence the consequent spread of infection, depends on the site of injury with relation to the fascial layers and the triangular ligament. Thus, if superficial to this structure, it will be limited by the attachment of Colles' fascia, which posteriorly encloses the superficial transverse perinæal muscles and unites with the triangular ligament, laterally is attached to the ischiopubic rami, and anteriorly is continuous with the dartos tunic of the scrotum. Hence the spread is forward over the scrotum and up over the crest of the pubes between the spine and the median line; reaching the abdomen it ascends, being prevented from passing into the thigh by the attachment of Scarpa's fascia below Poupart's ligament. If the membranous urethra is ruptured, the blood and urine may escape into the deep perinæal space between the layers of the triangular ligament; may break through the anterior layer and enter the superficial perinæal space; may work backward into the ischio-rectal regions, or, breaking through the deep layer of the triangular ligament, may work up into the prevesical space.

When the site of the injury is above the triangular ligament, effusion takes place about the neck of the bladder into the prevesical space and backward sub-peritonally, but it does not stop here and frequently spreads to the superficial perinæal space and to the ischio-rectal fossæ. As pointed out by Sir William De C. Wheeler,[7] anatomical barriers are apt to be swept away by the oncoming tide of blood and urine aided by subsequent infection, and it is not uncommon to find extravasation irregularly invading areas far beyond the theoretical limit. In the majority of cases, however, these fascial planes direct the spread of extravasation, and, therefore, incisions must open the fasciæ. The results of extravasation, with subsequent infection, loss of tissue, and profound toxæmia are too well known to require comment.

CLINICAL FEATURES

Shock in uncomplicated cases is extremely variable in degree. It may be entirely absent, or it may be so severe as to cause death. The shock attending associated injuries, such as fractured femur or fractured pelvis, is often severe and it is particularly in these cases that the more obscure genito-urinary lesions are apt to be overlooked. When the lesion involves the bladder alone the patient may probably be

able to void. The act is accompanied by a variable degree of pain and tenesmus, and the urine contains blood, the amount depending roughly on the extent of the injury. There may be indefinite pain and tenderness over the lower abdomen, and if the peritoneum is involved signs of peritonitis supervene. It is pointed out that the severity of the peritoneal complications depends on the condition of the bladder contents at the time of injury. Thus a patient with infected urine will rapidly develop a septic peritonitis. While this is generally true one cannot but remark upon certain cases where badly infected urine is discharged into the peritoneal cavity, yet, following prompt drainage, the patient, having apparently a high degree of immunity to the organism with which he has been in constant association, quickly gets well without evidence of peritonitis at any time.

The passage of blood *per urethram* is practically a constant feature when the injury is urethral. The amount of blood escaping at the meatus is often in inverse proportion to the extent of the injury. Thus, with the urethra only partially severed free escape is allowed, whereas with a more extensive injury the urethra may be completely severed, with retraction of the ends which contract and thus do not favour free exit. The result is a rapidly increasing hæmatoma in the perinæum.

Retention of urine is the rule but the patient may void a small amount of bloody urine with difficulty, and in exceptional cases may void with ease, but the urine will contain blood, usually in macroscopical amounts. Retention is not entirely the result of mechanical obstruction. Equally important, it is claimed, is the reflex spasm of the sphincters and compressor urethræ muscles, which, despite the most urgent desire to void, may not relax for many hours. Thus Nature prevents early extravasation in many cases.

Diagnosis

The diagnosis is not usually difficult when one has a history of injury with disturbance of micturition and hæmaturia, but it requires considerably more judgment to determine the precise site and extent of injury. If the patient has fallen astride an iron bar, or against the pommel of a saddle, and presents the classical signs, it is reasonable to suppose that the site of injury is in front of the triangular ligament; but if he has sustained a crushing injury to the pelvis the injury may be anywhere along the posterior urethra or bladder. A soft rubber catheter may be passed, to determine whether or not the urethra is involved, and it will usually be obstructed at the site of injury. If it passes into the bladder and no urine is obtained a rupture of the bladder or clot retention may be suspected. If a measured quantity of fluid is forced through the catheter and an equal quantity returns it is no proof of the integrity of the bladder wall. In one such case recently under observation operation showed that the catheter has passed through a tear in the wall into the space of Retzius. Similarly, there are cases on record where the catheter passed into the peritoneum and urine was obtained on repeated catheterization, so that the diagnosis was not established until the onset of peritonitis. Graves[7] states that drainage should be resorted to in those cases where ruptured bladder is suspected, even if not confirmed, as it is much safer to operate unnecessarily than to risk the serious and often fatal consequences of withholding operation in cases in which a rupture actually exists. Here it is worth while to recall that in the cases of intraperitoneal rupture referred to by Bartels all the patients died, with the single exception of the one on which operation was performed. When the trauma is slight the urine may be simply diverted by any of the methods to be outlined and the local injury may be left to itself, or an immediate suture may be attempted.

Treatment

Opinions and methods differ widely on the question of repair of the divided urethra. Men whose reputation is worthy of the deepest respect reconstruct the canal immediately over a catheter or other instrument, while others will not allow any instrument in the urethra at any time and never do an immediate repair. Wheeler[8] opens the bladder suprapubically and passes a catheter, aneurysm needle, or specially designed instrument in a retrograde fashion. The perinæum is then opened, crushed tissues excised, and bleeding controlled. The nose of the instrument previously

introduced is then insinuated through the proximal end of the divided urethra; a rubber catheter is passed via the meatus into the perinæal wound and secured by a thread to the first instrument, which is now withdrawn, pulling the catheter into the bladder, where it is secured by the thread; and a rubber tube of medium size is inserted above the pubes for drainage. The torn ends of the ruptured urethra are trimmed and defined, and joined together end to end by four or five interrupted fine catgut sutures. The surrounding tissues are loosely approximated, smeared over with "Bipp", and the skin closed, with a superficial drain at the most dependent angle. The end of the bed is raised to assist suprapubic drainage. The bladder is gently irrigated each day through the retained catheter. The catheter is changed every fourth day, either by stitching a fresh one to the meatal end of the one in use and pulling on the thread which comes through the suprapubic wound, or, alternatively, it may be fixed to the suprapubic thread and pulled through the bladder into the urethra by distal traction. Catheter and drainage are discarded in two weeks, but no instrument is passed until the healing of the perinæal and suprapubic wounds is complete, after a period of about six weeks. Turner[9] sutures the roof and lateral walls, leaving the floor open. Plisson describes a method of reconstruction over a rubber tube about the size of a No. 18 catheter, the tube being introduced through a suprapubic opening and moved back and forth daily. Young[10] cites a case in which the membranous urethra was completely torn across above the triangular ligament, with rupture of the vessels of the periprostatic region. The prostate was found two or three inches distant from the membranous urethra, and above it a greatly distended bladder, the prostate having been pushed up by a mass of extravasated blood. Accurate replacement and immediate suture were easily and successfully carried out. McWhorter[11] states that "the use of a seton over a long period of time, for the purpose of maintaining the lumen of the urethra, while permitting epithelialization and healing of the soft parts, is believed to be a valuable principle." He reports two interesting cases in which this principle was applied, the seton being left in place as a guide until all inflammatory reaction was passed, until new growth of epithelium had occurred, and the urethra dilated by sounds. Reconstruction by transplantation of the fascia lata is described by Brenner.[12] These special methods have their application, and some modification of the outline of Wheeler's technique is that generally employed when immediate repair is to be attempted.

When the injury is extensive the patient is often severely shocked and radical procedures are out of the question. Such patients must be kept warm, they should be given stimulants and other supporting measures should be taken. Then, the immediate indication, and the indication of prime importance, is to relieve the intravesical tension and to allow of the free escape of extravasated blood and urine. We cannot stress too emphatically the necessity of early and adequate drainage. On this, more than on any other factor, does the possibility of success depend. Radical attempts at repair are often disastrous at this time, and properly belong to a later period.

The second indication is to restore the damaged urethra and permit of normal function.

The methods of drainage commonly employed are: (1) retained urethral catheter; (2) suprapubic cystotomy; (3) perinæal section.

The choice of method varies according to the nature of the injury and the experience of the operator. There is no rule, and each case must be decided on its own merits.

The indwelling catheter, for minor degrees of injury, is used extensively by some clinicians. Peacock and Hain[6] report thirty cases and in 30 per cent this method was used effectively. Cecil[13] and Jastram,[14] independently, advise its use in all cases where there is no infection. Keyes[15] states that in any case of severe laceration the retention catheter invites infection. Turner (*loc. cit.*) expresses himself as follows. "When a catheter is in-dwelling the sphincter relaxes, allowing urine to trickle along its side to the wound, with subsequent infection tending further to scar tissue." Wheeler (*loc. cit.*) points out that this does not happen when suprapubic drainage is used; therefore reconstruction over a catheter is a rational procedure. In our experience its application is extremely limited. We employed it only in one case in this series, and then only as a palliative measure. This case was the result of a surgical instrumenta-

tion; it was seen several days after the injury, and generalized infection had already supervened.

We employed suprapubic cystotomy in sixteen cases. It provides adequate drainage and puts the bladder at rest. It is absolutely indicated in all cases in which there is a question of injury to the bladder or intraperitoneal extravasation, when the nature and extent of the lesion is doubtful or the bladder is likely to contain blood clot. It is the method of choice for the less experienced surgeon, and can be performed quickly under local anæsthesia on patients whose condition would not warrant general or spinal anæsthesia. Those who do not favour this route point out the danger of infection of the prevesical space and the possibility of depressing renal function in cases of badly damaged kidneys. Legueu and Rochet[16] comment on defective drainage after suprapubic incision. They point out the liability to infiltration of urine back of the pubes with insidious abscess formation, and they describe in detail their treatment by introducing a drainage tube through the perinæum. We rarely find it necessary to open the prevesical space. Our incision is well above the pubes, the fascia is incised in the middle line, the muscles separated; the peritoneal fold retracted, and the bladder opened at the vault.

Perinæal section is the method of choice when there is no reason to suspect injury to the bladder, and when the patient's condition will tolerate some form of general or spinal anæsthetic. We employ it, combined with multiple incisions, in all cases where extravasation has occurred. Fifteen cases in this series were treated in this way. With the patient in the extreme lithotomy position a grooved staff is passed to the site of the injury and an incision made in the midline over the perinæal hæmatoma. Blood clot is evacuated and bleeding is controlled as well as possible. The divided ends are then searched for, and if necessary a suprapubic incision is made. A sound is then passed from meatus to bladder, to bring the divided ends as nearly into apposition as possible, and a tube is introduced through the distal end to the bladder. The tube is removed in three to seven days, and three to four days later a sound is passed. The patient usually voids soon afterwards and all wounds promptly heal. (If a suprapubic cystotomy has been necessary the wound may be closed completely at operation after the perinæal tube has been introduced). Many of these patients were discharged in two weeks. The average period of hospitalization was much shorter than when the suprapubic route was employed, but the latter was used only in the case of those more seriously injured. We not infrequently combine suprapubic cystotomy with perinæal section when the proximal end of the divided urethra is not quickly identified. Although some operators have never found retrograde catheterization necessary we consider it a valuable aid, and preferable to traumatising already damaged tissues and prolonging the operation in search of the divided urethra. Those cases in which an immediate suture is possible are particularly favourable for perinæal section and we feel that they heal equally well and quickly without suture. Experience has shown that if a patent channel is maintained between the divided ends of the urethra the mucous membrane has the intrinsic power of covering large defects by virtue of the rapid proliferation of its epithelium. Besley[17] and Bevan[18] express similar opinions and Wesson[19] points out the rapidity with which epithelization takes place after prostatectomy.

As soon as all inflammatory reaction has subsided repeated dilatation must be carried out to maintain a patent canal and to combat stricture, which Keyes[15] states usually begins in six weeks. This is also the proper time to deal with those cases in which there is a complete obstruction and in which plastic operations are necessary.

The post-operative complications are chiefly the results of extravasation. Even if this is extensive there is little need to worry if the operation is performed in the first six hours. Delay enormously increases the gravity of the situation. Shock is particularly well marked when there are fractures or associated injuries, but may be severe when these are absent. Pneumonia is not more frequent than in other surgical conditions. Renal insufficiency is rarely of import, since it concerns old cases of strictures in which the urethra is torn by the surgeon, and in the long standing cases this is fortunately prevented by the extensive dense scar formation. Osteomyelitis of fractured pelvic bones is not common. We shall report

one case where this occurred but was not a troublesome feature.

IMMEDIATE RESULTS

Of the 32 operative cases, 25 were discharged as cured, that is, they had survived injury and operation and were restored to normal function. Two cases with long standing strictures were discharged as improved. Five patients died. These latter cases all had very severe injuries. One fell from a scaffold, fracturing his pelvis, femur, and arm, and, although he was operated upon early, he developed broncho-pneumonia, went into delirium tremens, and died. One case did not recover from the shock of the original injury and died a few hours after admission, while another, who was also severely injured, apparently never recovered from the shock, although he lived for nearly ten days. One already referred to as being treated palliatively with the retention catheter had a generalized infection on admission and died of septicæmia a week later. The fifth case had a carcinoma of the sigmoid colon which had involved the neck of the bladder producing marked difficulty of urination; a sound had been passed and had produced marked hæmaturia. He was admitted to hospital the following day with signs of peritoneal irritation. Laparotomy showed intraperitoneal extravasation, the abdominal cavity was drained and the urine diverted by a suprapubic cystotomy. The patient gradually weakened and died on the third day.

Of the cases which were discharged as cured many had very extensive injuries. The most recent case was a man of 38 years who was caught under a freight car as it slipped from its jacks. He sustained fractures of both femora, both sides of the pelvis, and the base of the skull. Because of the ragged fractures of the pelvis a catheter was passed without delay, and a small amount of dark bloody urine obtained. The problem was a difficult one, as he was severely shocked and the shock was increasing in severity. A blood transfusion was hastily made, and as he seemed to rally slightly, operation was decided upon about two hours later. A suprapubic cystotomy was quickly performed under local anæsthesia. There was a tear in the anterior wall of the bladder with marked hæmorrhagic and urinary infiltration of tissues in front of the bladder. The tear was incised further towards the vault, a Pezzer catheter inserted, and the bladder closed. The wound was closed with drain to the pre-vesical space. The femora were put up in extension by adhesive strapping, and with pillows only for support. Since there was no sign of increased intracranial pressure, and since it was essential for the extension, the foot of the bed was raised. He gradually improved; the tube was removed in two weeks, and a week later the bladder was quite healed.

Two other cases are worthy of report in some detail since they emphasize some points we wish to make clear.

CASE 1

J. N., male, aged 36; admitted June 4, 1926.

Complaints.—Severe pain about the pelvis; inability to pass urine; passage of blood *per urethram;* passage of blood *per rectum.*

History.—While crossing the street this patient was hit by a heavy truck. He was knocked down, falling on his face; the weight of the wheel came against the left side of the pelvis and passed half way across his body. He was immediately brought to the hospital and admitted to the general surgical department. When he was found to be bleeding from the meatus and unable to void he was transferred to the department of urology. On admission he was conscious, but was obviously in severe pain, and he was suffering from a mild degree of shock. General physical examination was negative.

Genito-urinary system.—Neither kidney was palpable. There was no tenderness on either side or along the course of either ureter. There was slight suprapubic tenderness but no distention or induration. Penis, scrotum and contents, were normal. There was some oozing of blood from the meatus. A soft rubber catheter was obstructed at the apex of the prostate. There was a slight fullness in the perinæum, with marked tenderness and ecchymosis extending to the lower part of the scrotum. The prostate, *per rectum,* was small and normal in contour and consistency. There was a transverse tear in the mucosa just between the two anal sphincters; also one just inside the internal sphincter. This tear admitted two fingers, and a spicule of bone presented into the rectum.

Operation was performed as quickly as possible after admission.

Operation. — (Suprapubic cystotomy: anæsthetic, novocain 1 per cent and ½ per cent). A median suprapubic incision was made, the fascia incised, and the muscles separated. Marked hæmorrhagic infiltration of the tissues was found. The peritoneal fold was low, and it was difficult to find the bladder on account of the infiltration. The bladder opened at the vault and turbid urine obtained. The bladder closed with a Pezzer catheter for drainage. The wound was closed with a prevesical drain. No attempt made to repair the urethra or to explore the rectum, except to remove the presenting spicule of bone.

On September 23rd, a second operation was performed with a view to restoring the urethra and to explore the perirectal fistula.

The patient was placed in the lithotomy position. A sound was passed to the bulbo-membranous junction, where distinct obstruction was felt. The urethra was

opened on the extremity of the sound. With a second sound passed through the suprapubic sinus into the prostatic urethra the extremity could be felt through the perinæal wound . This was opened and connected with the sound in the anterior urethra. Fistulæ about the rectum were explored and one opening just within the sphincter was cut outwards. The other large sinus, passing up to the right of the rectum and to the corresponding ischio-rectal fossa, was well curetted and packed with iodoform gauze. The upper portion of the wound was then sutured and a suprapubic drain left in position.

One week later a No. 24 F. sound was passed, with the finger in the prostatic urethra as a guide. The following day the suprapubic drain was removed, and after a second week the urethra was again dilated under gas anæsthesia, again using the finger as a guide and dilating to No. 30 F. Two days later (Oct. 11th), the patient voided a small amount, and in the course of the next few days was voiding nearly half his urine. The perirectal sinuses had practically healed, and he was up and walking about without difficulty. The suprapubic sinus closed rather slowly. He was dilated at frequent intervals and discharged on December 11th, voiding easily, with the suprapubic and perinæal wounds entirely healed. This patient has been under constant observation since his discharge in December, 1927, and is carrying on his duties as a truck driver. He reported last on August 12, 1929, and a No. 25 F. sound was passed without the slightest resistance at any point. When questioned as to his sexual competence he confidentially divulged the amazing fact that he believed it to be enhanced.

CASE 2

L. B., male, aged 35, admitted to the Department of General Surgery October 28, 1920.

Complaints.—Intense pain about the lower half of the body; inability to walk; inability to void.

History.—The patient was caught between two moving freight cars as they came together at a switch intersection. He was twisted about in a revolving manner and fell to the ground quite helpless. On admission he was conscious, though severely shocked, and suffering acute pain about the lower part of his body. There was marked tenderness and rigidity all over the lower abdomen, and the pain was much increased on pressure over the iliac bones. He was obviously suffering also from a fracture of the right femur. As he was unable to void, a catheter was passed and a small amount of bloody fluid obtained. Three ounces of boracic acid solution were injected, and a like amount siphoned off, which was bloody. There was marked ecchymosis about the scrotum and perinæum. Rectal examination showed no evidence of local injury; the prostate was of normal size, consistency, and contour. The genito-urinary surgeons were called in consultation the following morning, and immediate operation advised.

Operation.—October 29, 1920. A midline longitudinal incision was made, six inches long. The recti were separated, and the deep fascia was seen to be bulging. When this was incised about two quarts of bloody fluid escaped. The bladder was found to be torn on its anterior surface, the opening admitting the tips of two fingers. On exploring the bladder two spicules of bone could be felt sticking in from the fractured pubic bone. It was found that the catheter had passed through a second tear in the prostatic urethra and passed out into the prevesical space. The presenting spicules of bone were removed. A Pezzer catheter was sutured in the bladder wound, and the operation completed with drainage to prevesical space.

The wound healed fairly satisfactorily; the patient's general condition improved, and in four weeks he seemed strong enough for us to turn our attention to his genito-urinary condition.

December 3rd.—Under gas anæsthesia the suprapubic sinus was explored and found not to enter the bladder directly but to lead down to the prevesical space to the patient's left, where bare bone was felt and a large opening into the bladder. The sinus was excised. A drain was placed at the bladder vault, a piece of sequestrum removed from the bare bone, and the prevesical space was packed to control some oozing. The urethra was explored and the prostatic portion was found to be totally occluded. Nothing further was done. The packing was removed on the following day, but the lower angle of the wound was kept open for a time. All urine was drained through the tube at the vault of the bladder, and in three weeks everything seemed to be healed.

December 30th.—The suprapubic sinus was explored and found to pass directly to the bladder. The opening made on December 3rd, in the anterior wall of bladder to bare pubic bone on the left side, had granulated over, leaving no bone. A perinæal section was performed in the usual manner, the prostatic urethra dilated with the finger, and a perinæal tube introduced. The suprapubic sinus was excised and sutured. The tube was removed in a week, a No. 24 F. sound passed three days later, and he was discharged ten days after this, voiding freely, with all wounds healed. He has been under observation from time to time, is well to-day, and has no strictures.

These cases are extremely instructive. They demonstrate that in such a case the immediate indication is to sidetrack the urine, and that this is absolutely all that is essential if the case is taken in hand early. It can be done by anyone. Elaborate facilities are not required, and the case may be later referred to a specialist if plastic operations are necessary. Further, we wish to stress the point that if there is complete obstruction, or if for other reasons a plastic attempt at repair is to be undertaken, this should be done after all inflammatory reaction has subsided. It is in the first type of case where the urethra is injured at the bulbo-membranous portion that one meets with the most difficult strictures, and these cases lend themselves best to plastic operations. When the injury is above the triangular ligament, involving the prostatic urethra, the stricture is easily dilated and there is comparatively little scar contraction.

We could quote several similar cases of extensive lacerations of the urethra and bladder with comminuted fractures of the rami of the pelvic bones in which spicules of bone presented into the bladder. These cases did well with only a suprapubic cystotomy at the time of injury, and we feel sure that some of these patients would never have survived if anything more extensive had been attempted at the time.

LATE RESULTS

On our later results information is not so comprehensive as we would like, largely because most of the patients were workmen who move from place to place. We know that 15 of these are to-day alive and well, with normal function, and are carrying on their usual occupations. Two have died of intercurrent disease, and 1 reports that he is totally incontinent. This latter patient was injured many years before coming to the hospital. He came with a chronic extravasation and an exceedingly extensive stricture; he has been out of touch with the hospital since his discharge.

The most pertinent question is that of post-traumatic stricture. It is to be borne in mind that this stricture differs from an inflammatory stricture in that not only is the tissue of the urethra damaged but also the surrounding tissues; hence the development of scar tissue is invited. This is used by some as a basis for argument in favour of excising the damaged tissues and immediate repair of the urethra. While this is logical the development of fibrous tissue depends more on the extent of the injury and the individual tissue reaction than on the method of treatment. Further, if the damage is extensive and reconstruction of the urethra necessary, we feel that this can be most advantageously done, and damaged and scar tissue cleanly excised, after all inflammatory and traumatic reaction has subsided. Under the most favourable circumstances there is a real danger of extensive scar formation, and, therefore, all cases, except where the injury is trivial, should come under observation at frequent intervals throughout the remainder of their lives.

In conclusion, we would call attention to two difficult questions resulting from these injuries, the condition of sexual impotence, and proper industrial compensation.

Sexual impotence is thought to be due to the absence of erections or to faulty erections as a result of injury to the dorsal vessels or to the crura of the corpora cavernosa.

The problem of industrial compensation is a difficult one. To-day, an increasing number of States and Provinces are enacting workmen's compensation legislation. When one considers the necessity of repeated urethral dilatation, with its attendant inconvenience and discomfort, and the disastrous consequences of old neglected traumatic strictures, it is apparent that these sufferers are entitled to compensation.

I wish to thank Dr. D. W. MacKenzie, Chief of the Department of Urology, Royal Victoria Hospital, from whose service the cases were taken, for his many helpful suggestions throughout the preparation of this work.

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CYANIDE POISONING, ACUTE AND NONFATAL, APPARENTLY FROM HOTEL SILVER POLISH.—Huntington Williams says that during 1928 and 1929, certain widely separated groups of cases of acute and severe gastroenteritis have, on epidemiological investigation, indicated that a particular cyanide silver polish was their cause. The usual preliminary clinical diagnosis in nearly each instance has been either "ptomaine poisoning" or "food poisoning." With the removal of the silver polish in question from hotel pantries and restaurants there has been reported a cessation of complaints of such cases. Although definite and conclusive evidence of the etiology of the cases reported is perhaps not entirely possible, further studies are indicated. The health department of Newark, N.J., has prohibited the use of poisonous chemicals for the cleaning of silverware in that city. The sanitary codes of New York State and New York City have been amended to prohibit the use, in any public eating place within the state, of cyanide or other poisonous preparations for polishing kitchenware or silverware. —*J. Am. M. Ass.* **94**: 627, March 1, 1930.

DISEASES AND ANOMALIES OF THE URETERS

BY R. A. MCCOMB, M.D.,

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UNTIL fairly recently the ureter has not received a great deal of attention. Intended by nature to be merely an aqueduct, and seldom the source of actual disease, the ureter has indeed proved to be a potent factor in the causation of renal disease, and we have been slow to appreciate the consequences when unnatural conditions are present. With the introduction of pyelo-ureterography many interesting, and in fact astounding, conditions have been found.

To appreciate the cause of symptoms and the usual sequelæ one must remember that two principal factors are involved; (1) physiological; (2) physical.

Physiological.—The efflux of urine is produced by an intermittent muscular contraction starting in the pelvis of the kidney and ending at the ureteral orifice or possibly the muscles of the trigone, and this entire mechanism is extremely sensitive to pain. The only semblance of obstruction in the whole passage is at the ureteral orifice, and this automatically opens with the oncoming peristaltic wave.

Physical.—Any obstruction, however slight, along the passage produces a corresponding increase in peristalsis to overcome it, and also a dilatation above in direct proportion to its degree and the length of time it has been present. This change extends into the kidney itself with a corresponding degree of renal damage.

The changes which occur and the symptoms which accompany them are analogous to those occurring in other similar structures. If the obstruction is more or less acute the increased peristalsis rapidly amounts to spasm with excruciating pain until it is overcome or relieved. If it is chronic, the pain is less acute; the muscle at first hypertrophies, then becomes thinner, loses its tone, elasticity and sensitiveness to pain, until finally we probably have a huge pyonephrosis with no pain at all. This being the case, it therefore follows that the symptoms and pathological changes depend on the nature and location of the obstructions, the length of time they have been present, and the thoroughness with which they are removed.

Any attempt at classification is useless for the simple reason that, whatever the cause, the symptoms and end results sooner or later become the same, *i.e.*, pain, dilatation, infection, and renal damage, with the probable formation of calculus.

Probably the most common condition which draws our attention to the ureter, and one with which we are all familiar, is the ureteral calculus. There is a typical text-book description of the symptoms produced by this common offender, but I would say that the symptoms vary a great deal, depending on the size and location of the stone and the length of time it has been present in the ureter. Furthermore, any foreign body, such as a blood clot or large piece of mucus, will cause the same symptoms. If the stone obstructs the upper end of the ureter it will distend the renal pelvis and the pain will be very severe in the lumbar region. If it lodges part way down you can fairly well localize it. If it is low in the ureter, *i.e.*, in the bony pelvis, the pain will usually be low, and, furthermore, the patient will complain of frequency. This latter symptom is generally an evidence of its proximity to the bladder. The more it moves the more pain, and there are nearly always red blood cells in the urine. The more it obstructs the lumen the more liable the patient is to have pain in the lumbar region as well. Furthermore, a very large stone may be present for years without pain, due to loss of tone with dilatation of the wall of the ureter and renal pelvis. Radiation of pain into the testis, labium, or groin is by no means constant.

The question of ureteral calculus cannot be dismissed without reference to its simulating intestinal obstruction. In all cases where the latter is suspected, calculus must be ruled out. Moreover, many calculi, even with splendid technique, fail to show in an x-ray picture, while on the other hand one must be on guard

not to mistake pelvic phleboliths and calcareous mesenteric glands which appear in the region of the ureter for calculi, when we have ureteral symptoms from other causes.

A great deal has been heard lately about ureteral strictures, and although there is considerable controversy as to their frequency as a disease entity, there can be no doubt that they are to be seriously considered when one is confronted with almost any symptoms suggesting urinary disease, particularly those of renal colic, frequency, or obscure abdominal pain. They occur chiefly in one or more of three situations, namely, the uretero-pelvic junction, the brim of the true pelvis (see Fig. 1), the

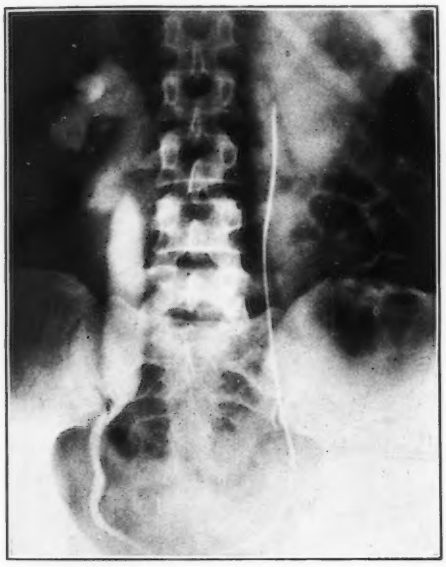

FIG. 1.—Stricture of the ureter at the pelvic brim, causing a dilatation and kinking of the ureter above and a hydronephrosis which eventually became infected. Nephrectomy.

intra-mural portion of the ureter, or just above it. The cause of their formation is still unsettled, but from the rapidly accumulating evidence one is inclined to believe that it is largely inflammatory. This theory is supported by the fact that a larger number of cases occur in women than in men. Pyelonephritis is more common in the former and clinical observations point to the fact that there is more than a possible relationship. It has also been observed that the ureters of women during pregnancy become dilated, elongated, and sometimes kinked. This results in obstruction and sometimes infection, and although this condition usually returns to normal, sometimes a persistent kink and hydroureter will remain, and this is a forerunner of a pyonephrosis.

Experimental infection of the ureteral wall in animals has been followed in a few months by stricture with dilatation above. Partial obstruction, experimentally, has been followed by dilatation, lengthening, tortuosities, and kinks.

Applying these observations clinically, it will be readily seen that, given any one of these conditions, a vicious circle is established, which can only result in renal destruction. If we remember that the ureter is closely adherent to the peritoneum over a great part of its course, it is easy to understand a possible inflammatory extension from this source. In the pelvis, also, it is subject to pelvic infections and pressure from tumours, particularly cancer of the cervix, uterus, and bladder. Prolonged and untreated urethral strictures, and more particularly prostatic obstructions, are of course a common cause of ureteral dilatation with consequent renal damage.

If infection is a cause of ureteral stricture, then doubtless some of our cases are legacies from the pyelitis of infancy and childhood, and here let me make a plea for the investigation of recurrent or continued urinary infections in children. These persistent cases which do not clear up with medical treatment are mostly due to some abnormality, such as a stricture or kink, early recognition of which may save the child from a life of misery.

Another cause of ureteral obstruction is an aberrant vessel (see Figs. 2 and 3) or band of fascia, when associated with renal ptosis. These vessels are quite common, and when a moderately moveable kidney drops on a vessel supplying the lower pole an obstruction is produced which creates marked disturbances and symptoms. The added factor of infection may cause adhesions and a permanent narrowing of the lumen of the ureter. The symptoms produced may be painful, gastrointestinal, nervous, or urological.

The pain is intermittent, varying from days to months. It is sharp and intense, commencing in the lumbar region or upper abdominal quadrant, and may radiate along the course of the ureter to the labium, testis, or thigh. The

FIG. 2.—Stricture of the ureter high up, which was caused by an aberrant artery. Symptoms of renal pain and frequency.

FIG. 3.—Calculus filling the pelvis and upper ureter above the obstruction, caused by an aberrant vessel.

standing posture aggravates it. Menstruation, or lying on the opposite side, intensifies the pain. Nausea and perspiration often accompany the more severe attacks. Between the attacks some patients experience a mild, more or less continuous, dragging pain or sensation of fullness in the lumbar region. The cause of the pain is back pressure in the kidney pelvis.

Nausea and vomiting not only accompany the severe renal colic but may be associated with the continuous dull lumbar pain, and also with gas, constipation, or hyperacidity. Progressive loss of weight accompanies these gastro-intestinal upsets in about one-third of the cases.

Nervous tendencies are not unusual and usually accompany the gastric symptoms. They vary from a slightly hyperactive nervous system to extreme nervousness. There may be insomnia and headache.

If unaccompanied by renal or bladder infections, there are few or no urinary symptoms. With infections, however, frequency, burning, nycturia, pyuria, and hæmaturia are common. The passage of a large quantity of cloudy urine may follow a severe renal colic. Hæmaturia is interesting because we may connect it with stone or cancer. It may be caused by congestion of the kidney, or the rupture of a minute vessel, the result of back pressure.

FIG. 4.—Infected hydronephrosis with stricture of the upper ureter; torsion of the kidney with the ureter entering laterally.

Other forms of ureteral disease are found, but are not particularly interesting clinically. The tuberculous ureter may become very much thickened and even entirely occluded. This is of interest because the lower end can sometimes be palpated, a valuable help in diagnosing a tuberculous kidney.

Multiple papillomata are sometimes found

FIG. 5.—Double ureter on the left side, one emptying normally into the bladder, the other emptying just external to the meatus—A girl eighteen years old with incontinence all her life.

FIG. 6.—Bilateral hydro-ureters, probably congenital; symptoms of frequency, pyuria, and occasionally hæmaturia for years.

FIG. 7.—Nephrotosis—Kidney in the true pelvis; symptoms of renal pain, and a tumour in the pelvis.

along the whole course of the ureter. These are usually implants from the renal pelvis, although they may arise as a primary ureteral neoplasm, producing symptoms of colic and hæmaturia.

Cystitis cystica has been seen to extend gradually up the ureter, producing no other symptoms than the cystitis from which it arises. Finally, however, the end result is distension and obstruction above.

FIG. 8.—Autopsy specimen of kidney, ureter and bladder. This had to be dissected off the descending colon and rectum. The patient was a married woman, twenty-seven years old, with a history of frequency and pyuria for only about a year, and temperature of 100° plus occasionally. There was a very large mass in the abdomen which filled the pelvis. On abdominal palpation and bimanual examination it felt like a large ovarian cyst. The left ureter could not be catheterized. Laparotomy revealed a large retroperitoneal mass, passing the mid-line. A pint of pus was evacuated from the lower abscess cavity by opening through the posterior fornix.

A. Destroyed kidney. B. Upper abscess cavity
C. Lower abscess cavity D. Bladder

Ureterocele may be accompanied by no early symptoms, but it does produce an obstruction which favours the formation of calculi, hydro-ureter, and hydronephrosis.

Regarding the anomalies of the ureter, I wish to mention them briefly and only as regards their relation to disease. No other anatomical system is so subject to congenital abnormality and each case is a potential trouble maker. The mere fact of their abnormal position is possibly the cause of either unusual pressure or poor drainage. Probably the most common diversion from normal is the double ureter on one or both sides, usually draining a dichotomous kidney. (See Fig. 5). Each ureter may empty separately into the bladder, but usually it joins its fellow of the same side before doing so. In one of my cases the ureter draining the upper pelvis which was infected emptied into a diverticulum of the bladder, while its fellow emptied normally and drained a healthy pelvis. This woman's symptoms were frequency, pyuria, dysuria, and hæmaturia.

We have also to deal with the congenital hydro-ureter, the possessor of which has an incurable pyelitis. (See Fig. 6). The ureterogram shows a very much distended, kinked, and elongated ureter, the upper end of which is as wide and open as the pelvis which it drains.

Ureters which drain a kidney found in the bony pelvis (see Fig. 7) or those in connection with horseshoe kidney need no special mention.

There is, however, a very distressing abnormality where the ureter, instead of emptying into the bladder, opens into the vagina or the anterior urethra, causing incontinence. Usually, it is an accessory ureter which makes the diagnosis much more difficult. These cases are mostly in females and have a history of partial incontinence, day and night, from birth. The diagnosis can only be made by very careful examination assisted by the intra-venous injection of indigo-carmine.

In conclusion, I would stress the fact that ureteral disease, whether congenital, mechanical, or inflammatory, presents symptoms according to the stage of development; that it is progressive and ultimately destroys the kidneys.

THE SERUM TREATMENT OF PNEUMONIA*

By Edward S. Mills, M.D.

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THE economic importance of any diesase in a community is measured by three factors, its incidence, its duration, and its mortality. Pneumonia accounts for about 10 per cent of the deaths in a community, and, if we consider that only one case out of four or five dies, the probability of a person taking the disease is indeed great. Because of this frequency and mortality pneumonia was aptly termed by Osler "Captain of the Men of Death." It is no respecter of age, sex, or locality.

The treatment of the disease has undergone as many changes as there have been physicians who treat it. Nevertheless, the mortality has remained distressingly high. But two years ago Norris and Farley[1] wrote in a well known text-book of medicine: "Articles are constantly appearing, written by enthusiastic advocates of certain lines of treatment, proclaiming greatly diminished death rates, supposedly the result of therapeutic success, but the mortality of pneumonia holds its own, unabated, in much the same proportion as that which our predecessors saw." Nevertheless, under the wise guidance of such men as Avery, Dochez, Chickering, and Cole, at the Rockefeller Institute, the laboratory has been developing a sound knowledge of the morphology and other characteristics of the pneumococcus.

The first step was the segregation of three different strains of the organism, and a fourth, or miscellaneous, group, from which at the present time three or four sub-groups of the first three are being weeded. More than half of all

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cases of pneumonia belong either to group I or II. Fortunately, only about 10 per cent belong to group III. About a third of the total belong to the fourth, or miscellaneous group.

After these specific strains of pneumococci had been segregated, it was found by Neufeld and Handel, and later by others, that animals when inoculated with killed cultures of these specific strains developed an immunity to the strain injected which was demonstrable in high dilutions. The serum from these immunized animals was found to cause agglutination in viable cultures of the same type against which they were immunized. This was actually the starting point of the serum treatment of pneumonia. Hopes ran high, but the first family of sera were, on the whole, a great disappointment to their parents. Their potency or titre was not great. They were bulky and they deteriorated rapidly. They were difficult to administer, and, finally, in about half of all cases they produced allergic or other reactions. The problem of concentration and purification was begun by Huntoon, but the concentrated sera as used today are the results of investigations by Felton, working under Rosenau at Harvard University. Hence the serum is known as Felton's concentrated antipneumococcus serum.

THE PREPARATION OF THE SERUM

A specific strain of killed pneumococci, *e.g.*, type I, is injected into horses at suitable intervals until the animals develop a serum of high titre or potency. A large amount of blood is then drained off and the serum separated. The process of purification and concentration, as worked out by Felton, is as follows. The serum is washed several times with distilled water, the sediment being allowed to settle each time. This sediment is then dissolved in half molecular sodium chloride solution and passed through a Berkefeld candle filter. After being tested for potency it is ready for use. By these means the final product is made to contain, volume for volume, ten times the antibody content. Two types of this concentrated serum are now on the market. One is a monovalent serum specific for only one type of pneumococcus infection. The other is a polyvalent serum made from types I and II, which is suitable for use before the type is known, or where the procedure of typing is not feasible.

FELTON'S METHOD OF STANDARDIZATION

In order to provide a serum of uniform potency, standardization was based on the unit system, as used for various antitoxins. A unit of Felton's concentrated serum is that amount necessary to protect a mouse against a million lethal doses of the pneumococcus. In actual practice the serum is titrated against a fixed amount of the culture. The sera on the market contain approximately 1,000 units per c.c.; so that a 20 c.c. vial will contain 20,000 units, the usual therapeutic dose.

HOW DOES THE SERUM ACT?

The serum is not an antitoxin. It is a concentrated solution of antibodies which act directly upon the organisms, not on the toxin which they produce, causing their agglutination and death. When monkeys are treated intratracheally with lethal doses of the pneumococcus, they develop a septicæmia and a pneumonia. Felton's concentrated serum will rapidly sterilize the blood stream, and the animals recover. The serum, therefore, cures by its bactericidal and not by its antitoxic action.

THE ADMINISTRATION OF THE SERUM

The serum should be given at the earliest possible moment after the diagnosis of lobar pneumonia has been made. Certain precautions must be observed, however, before therapeutic doses can be given. Every patient should first of all be tested for sensitivity to horse serum, and especially is this precaution to be observed if there is a history of asthma, hay fever, urticaria, or previous injections of horse serum. The simplest and one of the most reliable criteria of sensitivity is the conjunctival test. This is carried out as follows. A few drops of a 1 to 10 dilution of the serum are instilled into the conjunctival sac of one eye. If the patient is sensitive to the serum-protein a conjunctival reaction will appear within fifteen minutes, manifesting itself by hyperæmia of the conjunctiva, dilated conjunctival vessels, lacrimation, and sometimes itching. Should a positive conjunctival test be obtained no serum is to be given under any consideration. The serum is obtained in vials of two sizes, one containing 10,000 units each of types I and II, the other 20,000 units of each type. With every vial of

serum a diluted solution is supplied for the conjunctival test though it is only necessary to carry out this test before beginning treatment and if an interval of three or four days has elapsed since the last dose was given. The serum should be given intravenously. Where this method is impossible it may be given intramuscularly, but its potency is thereby cut in half. Before injection the serum should be carefully warmed just to body temperature. It should always be administered slowly, and this is particularly important during the initial injection.

THE DOSAGE OF THE SERUM

The treatment may be commenced as soon as the conjunctival test is found to be negative. The first injection of 10,000 units may be followed in four hours by a second of 20,000 units and this larger dose may be repeated every four hours thereafter, until the temperature has reached 100°. It has been the rule at the Montreal General Hospital to give 20,000 units every eight hours because of the cost of the serum, and so far our results have been equal to any reported. The usual management of a case of pneumonia should not be affected in any way by serum administration. Forcing of fluids, spongings, stimulants and oxygen all play a part in the ultimate favourable outcome.

THE FREQUENCY OF REACTIONS

In the days prior to concentration of the serum reactions of one type or another occurred in half of all cases. The serum was often rich in protein and lipoid substances which are prone to produce reactions. These reaction-producing substances have been largely removed through the precipitation methods already described. The present concentrated serum of Felton still gives reactions in a small percentage of cases. These reactions are of two types; thermal and allergic. The thermal reaction manifests itself at once by a chill with a rise in temperature of from two to three degrees. The allergic reactions are of two types. They may occur immediately with increased respirations, flushed face, and aprehension, or after a period of five to ten days when the well known urticarial or serum rash appears. All allergic reactions respond well to epinephrine, and ten minims of this drug should be given as soon as they are noted. The frequency of the various reactions in the experience with the New York cases was as follows; thermal 1 to 10 per cent, immediate allergic 5 per cent, and delayed allergic about 15 per cent.

THE RESULTS OF TREATMENT

So variable is the virulence of the pneumococcus from season to season and the individual susceptibility to the disease that it is difficult to gauge the effect of serum treatment. Some cases are mild and terminate early, while others run a stormy and prolonged course. The only absolutely fair criterion of success for any type

CHART I

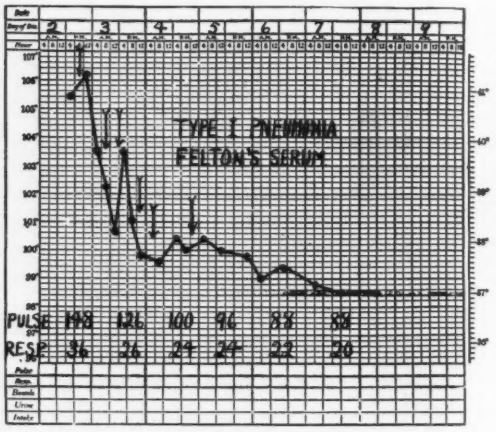


CHART II

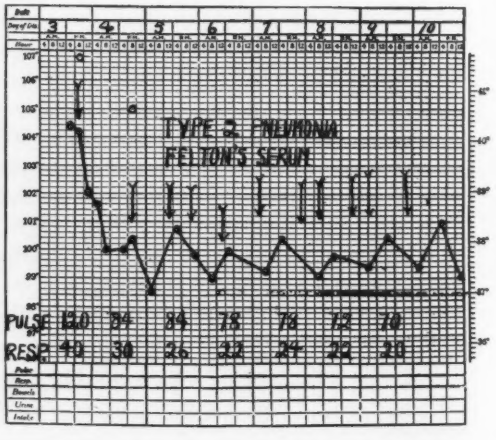


CHART III

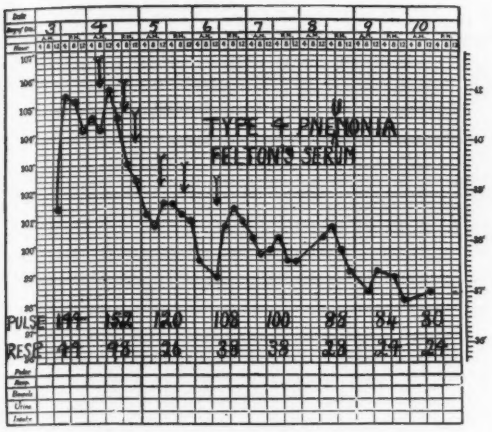
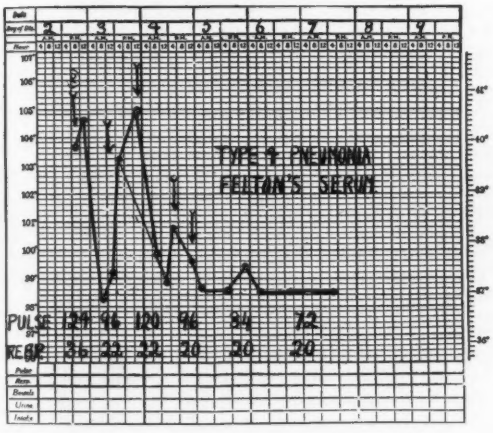


CHART IV



of treatment consists in a reduction of the mortality in a large well controlled series of cases. This has been done at the Bellevue and Harlem Hospitals by Cecil and Sutliff,[2] and by Bullowa.[3] Our own series of 52 cases at the Montreal General Hospital is far too small in itself to permit of generalization. So far, however, it is in agreement with the favourable results already published in the larger clinics in New York.

The few cases shown graphically were chosen from our series not because of any marked effect of the serum but because treatment was instituted early in the disease. They demonstrate the apparent improvement which follows its administration in a large proportion of cases. The arrows in the charts indicate 20,000 units of serum.

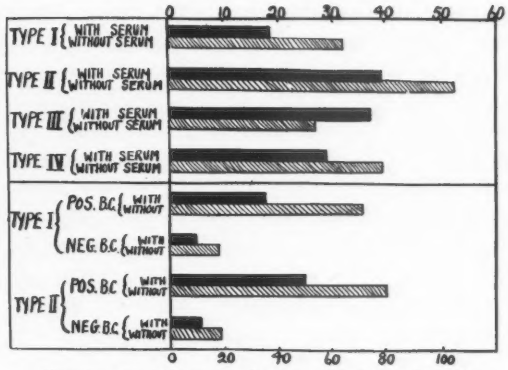
Our experience with the serum may be summarized as follows:

Number of serum treated cases	52	
Number of deaths	6	
Mortality percentage treated cases	11.5	
Number untreated cases same period	20	
Deaths in non-serum treated cases; excluding two cases with uræmia	10 8	
Mortality percentage in controls	40	
Mortality in 400 cases at Montreal General Hospital before serum treatment was begun	25	per cent

Of much greater significance than the results of our own small series of cases are the following statistics culled from recent reports in the literature. The mortality in all types of the disease is graphically represented. The efficiency of the serum in grave infections is clearly shown to be just as great as in the mild ones by grouping the cases into those with positive and those with negative blood cultures.

CHART V

Deaths per 100 cases, lobar pneumonia,
Bellevue Hospital, 1926-28
414 serum cases, 407 controls.



Deaths per 100 cases, Harlem Hospital 1926-28
393 serum cases, 400 controls
Positive and negative blood culture cases separated.

EFFECT OF SERUM ON THE CONSOLIDATION OF THE LUNG AND ON COMPLICATIONS

As a result of our own experience and that of others, it would seem that the serum has little effect on resolution, which pursues its usual course, neither hastened or retarded. Perhaps the same is true of complications. The one great and significant fact is that the mortality of pneumonia has been considerably reduced by the administration of Felton's serum.

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SCIATICA*

(AN APPRECIATION OF THE WORK OF DANFORD AND WILSON)

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PAIN in the distribution of the sciatic nerve may be present as a symptom in patients suffering from several well known diseases. It is said to occur, for instance, in syphilis, in diabetes, and in lead and alcohol poisoning. The writer has not met with it in these conditions. It does occur in some patients with intraspinal tumours and some other intraspinal conditions. We have seen it frequently in patients suffering from tuberculosis or new growths of the last lumbar vertebra. Indeed, it is a very common symptom of lumbo-sacral tuberculosis. It is not uncommon in spondylolisthesis. Such sciatic pain has been referred to as "symptomatic sciatica". There is, however, another and larger group of patients who present a syndrome so characteristic as to be regarded as an entity. This syndrome has been called "idiopathic" or "essential" sciatica. It is the object of this paper to show that all the features of idiopathic sciatica can be accounted for by an infectious lumbo-sacral arthritis; and that, therefore, in the case of any patient in whom such an arthritis can be proved to exist, his sciatica should not be classed as idiopathic, but should be regarded as symptomatic of the arthritis. Or, put in another way, the sciatica of our textbooks is usually a manifestation of lumbo-sacral arthritis.

To illustrate the class of patients we are considering, the following history is presented:

F. D., male, aged 39, a returned soldier; a travelling salesman since the War; working as a farm labourer for the past six months.

On the morning of December 1st he was feeling perfectly well; he lifted a fork full of hay and was in the act of throwing it into the loft, when he was seized with severe pain across the small of his back, and could not straighten up. He walked bent over for three or four days, then gradually recovered his ability to walk erect, but any attempt to bend his back caused severe pain. Thus, he went carefully about his work. Ten days after onset he again "sprained his back," and that night for the first time he felt pain in his left lower limb. It was so severe that he stayed in bed the next day. Three or four days later he was again back doing some work, but walking very guardedly.

Five weeks after the onset he was working in a draughty granary. He felt chilly when he went in to dinner, and experienced severe dull pain in the left leg. As this did not clear up he entered St. Boniface Hospital six days later.

Examination on January 13th, (six weeks after onset) showed that he walked with his back stiff and limped on the left limb. Movements of the lumbar spine were very limited and painful, and as he bent forward his body inclined to the left. Raising either lower limb with the knee extended caused an exacerbation of the pain complained of, as did the application of the cross leg test and Gaenslen's test. Compressing the iliac crests did not cause pain. The left knee-jerk was diminished, the left ankle-jerk was absent, and the left calf measured one-half inch less than the right. We could not demonstrate any changes of sensation, but the patient complained of numbness at the outer side of the left calf. There was well marked tenderness on pressure on certain areas of the buttocks and back of the thigh along the course of the sciatic nerve. Pinching of these muscles also revealed tenderness. Dr. C. M. Clare found that his tonsils were diseased. The x-ray picture showed some hypertrophic changes in the lumbar region of this man of thirty-five. It also showed the lumbar spine to be inclined slightly to the left.

Manipulation under an anæsthetic, regulation of diet, saline catharsis, hot baths, baking and massage were followed by prompt improvement. He refused tonsillectomy. He left the hospital twenty-six days after admission, feeling well. His subsequent history is not known.

Fig. 1 is a reproduction from Danford and Wilson's article showing very similar findings in one of their patients.

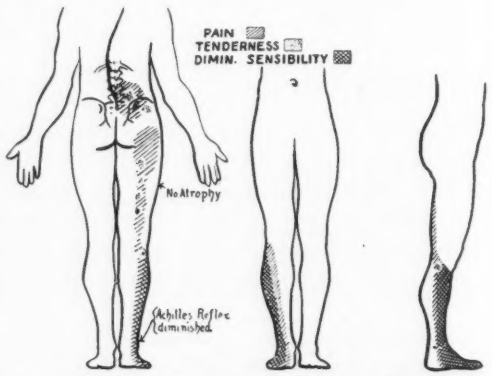

FIG. 1.—Typical sciatica (Danford and Wilson.)

* Read before the Winnipeg Medical Society, September 20, 1929.

Pathogenesis of Sciatica

There are certain clinical features of idiopathic sciatica which point to some toxic or infectious agent as the cause. Other features indicate that in many patients at least a neuritis must be present. And there is an overwhelming array of evidence that makes one feel that these patients are suffering from an arthritis. These features are listed in the three tables. Careful perusal of these tables convinces one that they point inevitably to the conclusion that idiopathic sciatica is due to a toxic or infectious arthritis in such a situation that the arthritis interferes with the nerve or nerve roots concerned.

Table I

Clinical features pointing to a toxic or infectious cause—
"Rheumatism"–"Sciatic Rheumatism"

1. History of exposure to cold or wet.
2. Antecedent pain in the back (lumbago).
3. Presence of foci of infection.
4. Tendency to spontaneous recovery.
5. Results of various forms of treatment.

Table II

Clinical features pointing to a Neuritis.

1. History of exposure to cold or wet.
2. Neurological findings:
   - (a) Tenderness "over the sciatic nerve."
   - (b) Sensory changes: numbness: diminished cutaneous sensibility.
   - (c) Lost or diminished Achilles reflex.
   - (d) Muscle atrophy.
   - (e) Fibrillary twitching.
   - (f) Coldness of the leg and foot.
3. Pain on "straight leg raising."
4. Nature and distribution of the pain.
5. Results of various forms of treatment.

Table III

Clinical features pointing to Arthritis

1. History of exposure to cold or trauma.
2. Pain aggravated by movement.
3. Pain in the lumbar region.
4. Associated arthritis in other joints.
5. Examination of spine:
   - (a) Guarded gait.
   - (b) Muscle spasm.
   - (c) Limitation of movement and pain on movement.
   - (d) "List" to one side or other.
   - (e) Tenderness in lumbar region.
6. Results of special tests:
   - (a) Straight leg raising.
   - (b) Cross leg test.
   - (c) Gaenslen's test.
7. Pressure of foci of infection.
8. X-ray findings.

This I believe has been the position taken by orthopædic surgeons for many years, the main point of disagreement being whether the disturbance is in the sacro-iliac or lumbo-sacral joint. The fundamentally unstable character of both these joints has often been emphasized and need not detain us long. They have probably both been subject to strain ever since man's ancestors assumed the erect position, and both are therefore prone to arthritis. Disturbances of either cause backache. It remains for us to determine if possible in which joint an arthritis can produce the clinical features of sciatica, with its accompanying neurological findings.

Smith-Peterson[1] has made several valuable contributions to the differential diagnosis between lumbo-sacral and sacro-iliac disease. Among other things he suggests that the sciatic pain associated with sacro-iliac disease is of the same nature as the pain felt in the knee in hip joint disease—a referred pain; and that the limitation of movement and the positive straight leg-raising test are due to muscle spasm, as a protective measure guarding the injured joint. Other writers have attempted to explain the neurological findings of sciatica by assuming that periarticular swelling of this joint would produce pressure upon the nerves of the sacral plexus, either in the pelvis or at their exit through the sacro-sciatic foramen. These explanations have never appealed to the writer as being adequate. He has seen pain referred to the buttocks and back of the thigh in sacro-iliac tuberculosis, but never the typical syndrome of idiopathic sciatica. In fact, in those cases of proved sacro-iliac lesions, such as tuberculosis and severe trauma, that the writer has seen, the neurological findings of sciatica have been conspicuous by their absence.

Various tests have been applied in the hope of differentiating diseases of these joints. The old method of compressing the iliac crests, if positive, is of great value. Too often it is negative, even when we know from other features that there is gross disease in the sacro-iliac joint. To use the lower limb as a lever, to manipulate the ilium on the sacrum, seemed at first to offer a more effective way of determining diseases of this joint. The straight leg-raising test, the cross leg test, and the Gaenslen test[2] have all been used with this in view. We have found them disappointing. If there is a tender lumbo-sacral joint, the application of enough force through the lower limb to test the integrity of the sacro-iliac joints will jar a diseased lumbar spine enough to cause the pain complained of, thus vitiating the test. In several patients with un-

doubted tuberculosis, and in one patient with a new growth of the last lumbar vertebra, in all of whom there was absolutely no reason to regard the sacro-iliac joint as anything but normal, these tests were all positive.

It remained for Danford and Wilson[3] to clear up many of these points. They attacked the problems first in the dissecting room, using twelve subjects, and then clinically in the wards, studying twenty-one patients. Many of their observations are quoted below.

ANATOMICAL CONSIDERATIONS

If we review the anatomy of the part, we are reminded that the sciatic nerve is derived from a part of the anterior ramus of the fourth lumbar root, together with the anterior rami of the fifth lumbar and the first, second, and third sacral roots. The gluteal nerves come from practically the same source, the superior from the fourth and fifth lumbar and first sacral, and the inferior from the fifth lumbar and first and second sacral. The fifth lumbar root contributes to the supply of almost all the muscles of the buttocks, of the posterior aspect of the thigh, of the leg, and of the foot. The few exceptions are listed in Table IV. We must remember that it

TABLE IV

The Fifth Lumbar Nerve

It contributes to the nerve supply of all the muscles of the buttocks, of the back of the thigh, of the leg, and of the foot, except:

1. Pyriformis, obturator internus, and superior gemellus.
2. The gastrocnemius (the soleus is not an exception.)
3. Those small muscles of the sole of the foot supplied by the lateral plantar nerve. (Cunnigham.)

not only sends motor fibres to these muscles but also receives sensory fibres from them, so that pain in the muscles, or tenderness on pressure upon them, would result from pathological changes in the axis-cylinder processes of which this root is composed. The cutaneous distribution of the fifth lumbar root is given differently by different authorities, and no doubt varies in different subjects, but is generally regarded as including the outer side of the leg.

Table V, taken from Danford and Wilson's article, helps to clear up a point that had long puzzled the writer. He had been accustomed to regard the centre for the Achilles jerk as given by Purves Stuart, but, as you see from the table, other neurologists place it higher. Again the fifth lumbar root is implicated.

TABLE V

Spinal localization of centres for

Achilles Reflex:	
Babinski	Lumbar 5 and Sacral 1
Oppenheim	Lumbar 5 and Sacral 1
Kraus	Lumbar 5 and Sacral 1 and 2
Purves Stuart ...	Sacral 1 and 2
Patellar Reflex:	
Oppenheim	Lumbar 2, 3, and 4
Kraus	Lumbar 3
Purves Stuart ...	Lumbar 3 and 4
Jelliffe and White	Lumbar 3 and 4
Plantar Reflex:	
Danford and Wilson	Sacral 1 and 2

To sum up, on anatomical grounds, the neurological findings of the typical case of idiopathic sciatica can be accounted for by a neuritis of the fifth lumbar root. When Danford and Wilson studied the anatomical relationships of this root to the joints under consideration, they found some very illuminating evidence. It will be remembered that each root comes out through an intervertebral foramen. They point out that the posterior articulation forms the posterior boundary of this foramen, while the anterior boundary in the lumbar region is formed by the intervertebral disc, and a small part of the body of each vertebra concerned. Studying the relative sizes of the intervertebral foramina in the lumbar region, they found that the one through which the fifth lumbar root passes was always smaller than the others, that the fourth lumbar was always next smaller, and that those above were always larger. Conversely, the nerve root that passes through this canal was always largest in the case of the fifth, next largest in the case of the fourth, and smaller in the case of the other lumbar nerves. They concluded that arthritis in the posterior articulation, periarticular swelling, or the formation of osteophytes, would be very likely to constrict the nerve root in the case of the fifth, and to a less extent in the fourth, and to a still less extent in the case of the other lumbar roots.

The writer has not taken the opportunity to confirm these anatomical findings personally, except that through the kindness of Dr. J. C. B. Grant, Professor of Anatomy in the Medical Faculty of the University of Manitoba, he was able to dissect out these roots in three subjects in the dissecting room last spring. He found in

all three confirmation of what has just been stated. He was using a pair of forceps the handle of which was about one centimetre wide. This passed readily into the upper lumbar inter-vertebral foramina, less readily into the fourth, and not at all into the fifth. A further point was brought out in this dissection, which has since been confirmed by a study of several skeletons, and which has been noted by Putti.[4] The bony canal through which the lumbar root passes is much longer than that traversed by its fellows, and it is still further lengthened by the lateral lumbo-sacral ligament, which according to Cunningham[5] "extends from the anterior aspect of the inferior border of the transverse process of the fifth lumbar vertebra downward and slightly laterally to the front of the anterior aspect of the ala of the sacrum, close to the sacro-iliac joint." The result of this arrangement is that the large fifth lumbar root, in its passage from its intraspinal origin to the pelvis, is enclosed in a long tortuous narrow canal not much larger than the root itself, and quite different from the path of exit of the other smaller lumbar roots.

A study of the sacro-iliac joints revealed no such anatomical condition that could produce pressure on any of the trunks of the sacral plexus. These trunks, Danford and Wilson found, lay well medial to the joint, except at their exit from the pelvis, and were nowhere enclosed in the canal, bony or otherwise, but were free to pass forward, out of the way should pressure occur from behind. But Danford and Wilson record other findings that would lead to compression of the fifth lumbar root.

That part of the fourth lumbar root which is destined to take part in the formation of the sacral plexus, passes down over the transverse process of the fifth lumbar vertebra well away from the body of it, but the fifth root passes downward into the pelvis resting successively on the body of the fifth lumbar vertebra, on the inter-vertebral disc, and on the lateral margin of the superior surface of the sacrum. In two of their subjects there had been osteoarthritic changes in this situation, and the fifth nerve had been partially surrounded by the outeroppings of bone so that it lay in a groove or partial canal formed by the osteophytes. A similar condition exists in the pelvis depicted in Fig. 2.

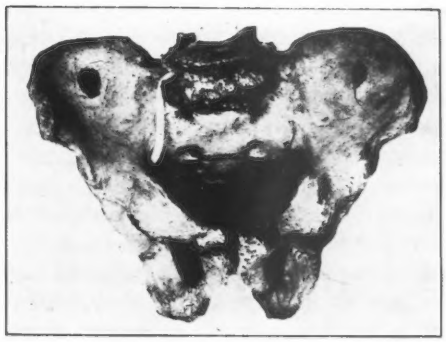

Fig. 2.—Photograph of pelvis with advanced osteo-arthritic changes. The rubber tubing represents the course of the fifth lumbar root. (Courtesy of Dr. H. P. H. Galloway.)

Fig. 3.—Drawing by Dr. A. Blondal of Winnipeg, of the same pelvis as shown in Fig. 2. The artist has put in the roots of the sacral plexus. Note how the fifth lumbar root would be compressed by the osteoarthritis which has produced bony ankylosis between the fifth lumbar vertebra and the sacrum.

In this pelvis osteoarthritis has progressed until there is bony ankylosis between the fifth lumbar vertebra and the sacrum. It shows a distinct groove along which the fifth lumbar must have passed, and in which the rubber tubing was placed before the photograph was taken. Fig. 3 is a drawing of the same pelvis by Dr. A. Blondal, which depicts the specimen much better than the photograph. The artist has added the roots of the sacral plexus as he conceives them. It is difficult to imagine that the man who owned this pelvis did not at one time suffer from neuralgic pains in the distribution of his fifth lumbar root, or that he did not present many of the neurological findings of idiopathic sciatica.

Danford and Wilson took the opportunity to study the effect of some of the tests and movements ordinarily used in the clinical study of

cases of sciatica on the nerve roots in the case of their twelve subjects. They found that backward bending diminished the size of the intervertebral foramen, and could be expected to cause root pain when the size of the canal had already been diminished by periarticular swelling, especially in the case of the fifth. Bending to the same side produced the same result. Bending in the opposite direction increased the size of the foramen, but could be expected to produce pain if arthritis were present. Forward bending increased the size of the intervertebral canal, but if done in the standing position would have the same effect as the next manœuvre. Straight leg raising put tension on the fourth and fifth lumbar roots. Movement of the sacro-iliac joint could often be demonstrated by straight leg raising, the cross leg test, and Gaenslen's test, but whenever it could be so demonstrated, it could be equally well demonstrated by compressing the iliac crests.

Correlation of Anatomy With Clinical Phenomena

Now if we refer again to Tables I, II and III, we shall find the clinical features very well accounted for on the assumption that sciatica may be due to lumbo-sacral arthritis. The history of exposure to cold and wet or trauma fits in well with this conception. Antecedent pain in the back is the local pain of the arthritis. Associated pain in other joints, when it occurs, simply means that the arthritis is multiple; and foci of infection have the same significance here as in arthritis of hip or knee. The patient will begin to recover when the arthritis quiets down sufficiently to relieve the nerve root of the pressure. If organic changes have occurred in the fifth nerve root the sciatic pain will persist long after the arthritis has subsided. On the other hand if this root has been actually destroyed by bony outgrowths the pain will eventually disappear, but muscle atrophy, loss of muscle power, diminished cutaneous sensibility, and perhaps loss of ankle jerk will persist. Improvement following stretching of the nerve, and other forms of manipulation may be due to modification of the blood supply to the part or to breaking up of adhesions. No explanation is offered for the good results that have followed the injection of various substances into or around the nerve. On the other hand, the frequent failure of such treatment is easily accounted for. Rest, the application of heat, modification of diet, elimination of foci of infection, and vaccine therapy should act here as in other forms of arthritis.

The "tenderness over the sciatic nerve" is really tenderness on pressure applied to the muscles partially supplied by the fifth lumbar root. We get the same findings in any muscle whose nerve supply has been injured, as for instance in the traumatic brachial neuritis described by Gibson,[6] and in the tenderness that

FIG. 4.—"List" away from the lesion in a patient with typical right sided sciatica; referred by Dr. I. Pearlman.

is such a characteristic feature in many cases of infantile paralysis during the first few months. Interference with the Achilles reflex is easily accounted for if we accept the teaching of those who place the centre for this reflex as high as the fifth lumbar. Numbness and diminished cutaneous sensibility should follow the cutaneous distribution of the fifth lumbar root, and in our experience they are usually found at the outer side of leg. Muscle atrophy and fibrillary twitching, when present, will be manifest in those muscles that derive part of their nerve supply from this root. A positive straight

leg raising test on the affected side may be due to increased tension on compressed root, but inasmuch as it is often obtained by raising the opposite limb it probably has the same significance as a positive cross leg test or Gaenslen's test; *i.e.*, it jars the tender lumbo-sacral joint. The characteristic deep pain of sciatica felt in the muscles of the thigh and calf is due to compression of the axis cylinder processes that carry afferent impulses from these muscles, while the more superficial burning or stinging pain felt at the outer side of the leg is referred to the cutaneous distribution of this root. A "list" away from the lesion (see Fig. 4), is Nature's effort to relieve the compressed root by widening the intervertebral canal. A list toward the lesion is less common, but does occur. Probably it represents Nature's effort to splint the tender joint by muscle spasm.

The other phenomena in Table III do not require elaboration, but a few words regarding the x-ray findings seem necessary.

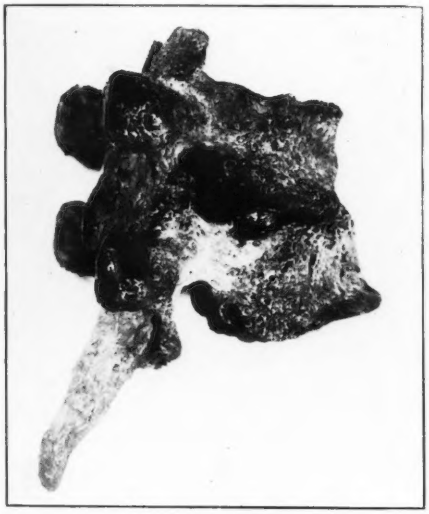

Fig. 5.—Severe osteoarthritis fusing the bodies of the two thoracic vertebræ. Note the osteoarthritic changes showing in the lateral articulation.

X-Ray Examination

Good films are essential in the examination of every patient complaining of sciatic pain. The result may be negative. It will be positive in an increasing proportion of cases if stereoscopic films are made with the vertical shift, and if a good lateral view is obtained. If this is done, one will not miss such major diseases as lumbo-sacral tuberculosis or new growths, spondylolisthesis, and osteoarthritis of the hip. Lipping of the bodies of the vertebræ must be interpreted with caution, because this is a very common finding in individuals past middle life. But that is only another way of saying that most people past middle life have some osteoarthritis of the lumbar spine, as evidenced by limitation of movement and inability to do hard labouring work. Occasionally, one can see evidence of osteoarthritis in the lateral articulations. This is surely significant. It is probable that osteoarthritis of the bodies of the vertebræ is usually accompanied by osteoarthritis of the lateral articulations. Fig. 5, shows such a condition in the thoracic spine. As the lateral articulations in the lumbo-sacral joint are usually in the coronal plane, osteoarthritic changes do not often show on the film. They are more easily seen in the interlumbar articulations, where they are in the sagittal plane.

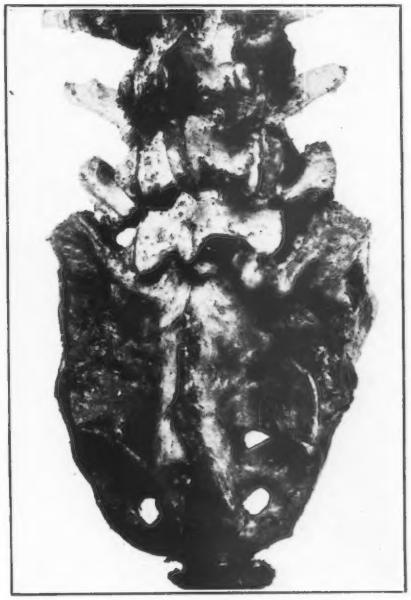

Fig. 6.—Specimen from the anatomical museum, University of Manitoba. The right lateral articulation of the lumbo-sacral joint in the coronal plane as is usual; the left is of the interlumbar type, being in the sagittal plane. (Courtesy of Dr. J. C. B. Grant.)

Putti[4] emphasizes the importance of such an anomaly of these joints as shown in Fig. 6. Here the right lateral articulation of the lumbo-sacral joint is of the interlumbar type, in the sagittal plane, while the left one is in the

coronal plane, as is usual in this joint. Undoubtedly many lumbo-sacral anomalies predispose to back strain, and, therefore, to arthritis. Partial sacralization of the last lumbar vertebra and abnormal transverse processes may act in this way by producing abnormal leverage. Spina bifida occulta and defective spinous processes of the sacral vertebræ mean defective attachments for muscles and ligaments, weaker muscles and ligaments, a back more easily sprained, and therefore more prone to arthritis. Finally, it is important to remember that the x-ray examination shows only gross bony changes, and, therefore, the ordinary infectious arthritis that is behind many cases of acute sciatica cannot be disclosed by an x-ray examination. And if we all had the clinical acumen of the master physicians of the past the x-ray might not be necessary. Twenty-three years ago good roentgenograms of the lumbo-sacral region must have been rare. But in Osler's textbook,[7] we read "More commonly however the condition (sciatica) is due to chronic arthritis of the spinal column."

SUMMARY

1. The fifth lumbar root, in its passage from its intraspinal origin to the pelvis, traverses a relatively long, narrow, tortuous, and rigid canal, in which it can easily be injured by pressure of periarticular swelling or osteophytes of lumbo-sacral arthritis.

2. The clinical features of "idiopathic sciatica" can all be accounted for on the assumption that the underlying pathological condition is lumbo-sacral arthritis.

3. The frequency of sciatic pain as a symptom of lumbo-sacral Pott's disease is confirmatory evidence of this theory of the pathogenesis of sciatica.

4. There are many clinical features of sciatica that cannot be accounted for on the assumption that the underlying lesion is in the sacro-iliac joint.

5. The writer concludes from this study that the large group of cases previously classed as "idiopathic sciatica" should be regarded as "symptomatic sciatica" due to lumbo-sacral arthritis.

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MIKULICZ'S DISEASE*

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THIS comparatively rare condition was first described by Mikulicz[1] in 1888, and an account of it published by him[2] in 1892, though in 1889, Haltenoff[3] reported a similar case. Subsequently many cases have been reported under this title and much discussion has arisen regarding this and allied conditions.

The syndrome of Mikulicz's disease proper consists in a chronic, painless, progressive, bilateral enlargement of the lacrimal, parotid, submaxillary and sublingual glands. The glands are not adherent and show no tenderness or other sign of inflammatory involvement. The enlargement is idiopathic, benign, and usually occurs in young adults, though no age is exempt. There is no tendency to recurrence after complete extirpation. There is no fever nor malaise, and, apart from mechanical difficulty in moving the eyelids or eyeballs, possibly lacrimation, and dysphagia due partly to dryness of the mouth, the only complaint arises from disfigurement. There is no evidence of disease in the lymph glands or blood, nor is the spleen enlarged. The process usually begins in the lacrimal glands and progressively attacks the others. Occasionally, the accessory lacrimal and salivary glands may be attacked and one of a pair of glands alone may show enlargement, as reported

* Read before the Section of Pathology, Academy of Medicine, Toronto, November 26, 1929.

by Berlin[4] and others. Involvement of the lacrimals alone was reported by Pause,[5] Terrien,[6] and Stoewer;[7] of the parotids alone, by Lafolley,[8] and Kummell;[9] of the submaxillary glands alone, by Lafolley, and Kummell. These exceptional cases are extracted in Howard's[10] article.

CASE REPORT

This paper is based on the case of a negress, aged 15, a student. The complaint was progressive swelling of the upper right eyelid for three years and a similar swelling of the lower left eyelid in its lateral portion for three months. The first symptom was difficulty in raising the right eyelid in the morning, which led her to consult the school physician. The swelling persisted and gradually increased in size, but without interfering with vision, and never with any sign of inflammation or discharge. The swelling in the left lower eyelid was only noticed in the previous three months, but was gradually increasing in size.

Personal and family history.—There was no history of past illness, and the family history was negative.

Functional enquiry revealed a history of frequent headaches, relieved by nosebleed, which was easily brought on by holding the head very low. There had been frequent sore throat in the last three years. Constipation was habitual.

Physical examination.—The general physical examination was negative. There was a mass in the lateral part of the right upper eyelid about the size of an almond, firm like rubber in consistency, not attached to the skin or tarsal plate but apparently fixed to the wall of the orbit. The conjunctiva was clear. The pupils were round, regular, and equal, and reacted to light and accommodation. The mass in the left lower lid was situated laterally, about the size of an oat and freely moveable under the skin. The left lacrimal gland was not palpable. The movements of the eyes were free and normal.

The submaxillary and sublingual glands were palpable and moderately enlarged, particularly the latter; the parotid glands showed only a suggestion of palpable enlargement. There were no other glandular enlargements. Physical examination was negative otherwise, except for some tenderness over the cæcum and ascending colon on deep pressure.

Urine examination and *Wassermann reports* were negative.

Blood examination.—Hæmoglobin 80 per cent; red blood cells 5,530,000 per c.mm.; white blood cells 7,000; differential count: polymorphonuclears 62 per cent, lymphocytes 23 per cent, endothelial cells 4 per cent, basophiles 1 per cent, eosinophiles 10 per cent.

Operation.—The mass over the right upper eyelid was removed under local anæsthesia.

Pathological report.—The specimen is a firm, rubbery nodule about the size of a large white bean. The covering is fibrous. On section, it is firm, pink in colour, and homogeneous.

Microscopic examination shows very little glandular structure, which is represented by a few acini lined by a single layer of cuboidal epithelium on a basement

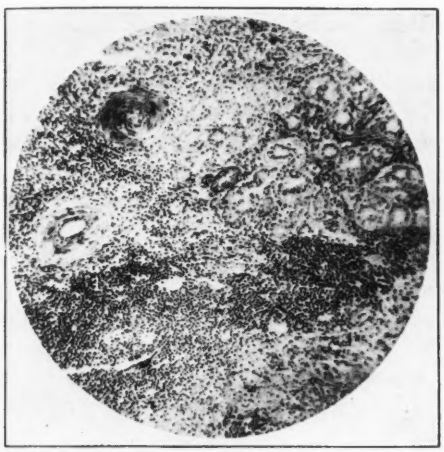

FIG. 1.—Portion of the lacrimal gland showing marked round-celled infiltration, increase in fibrous tissue, endarteritis obliterans, and some remnants of acinar tissue. X 200.

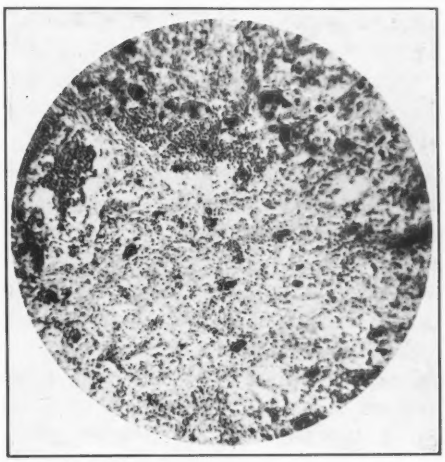

FIG. 2.—Lacrimal gland showing replacement of the alveolar structure by round-celled infiltration and fibrous tissue. The ducts are represented by dense cords of cubical cells. X 200.

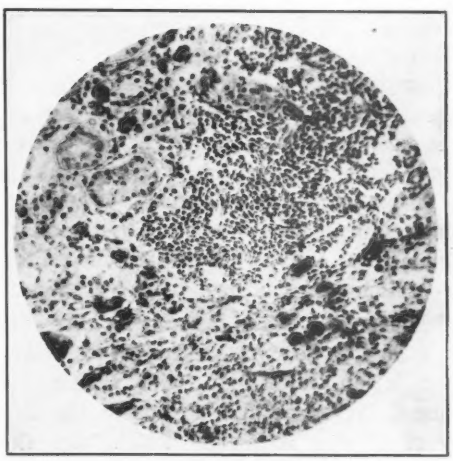

FIG. 3.—Lacrimal gland showing remnants of acinar and duct structure, round-celled infiltration and fibrosis. X 400.

membrane. These are embedded in sheets of fibrous tissue. The tissue is moderately vascular and very cellular on account of a diffuse round-cell infiltration. The fibrous tissue which forms the bulk of the structure is arranged in sheets, between which are strands and masses of round cells, accumulations of infiltrating lymphocytes.

The clinical course was uneventful, but was characterized by periodical rise in temperature to 100° F. every four or five days.

This case corresponds closely to that of Berlin, but shows also enlargement of an accessory lacrimal gland in the left lower eyelid, definite sublingual enlargement on palpation, and a suspicion of palpable enlargement of the other salivary glands. The chest examination was negative. Syphilis was ruled out by a negative Wassermann reaction, and there was no history that would point to other cause of enlargement of these glands. The lymph glands, spleen, and blood examination were negative.

Mikulicz's disease was originally considered a chronic infective condition and an entity; nor, in the light of recent work by Rosenow and, later, by Wilkie, on the elective localization of organisms, particularly in the gall bladder, is one justified in departing from this view. Sialodochitis fibrinosa may cause enlargement of one or more of the salivary glands, but the cause is usually an ascending infection from a dirty buccal cavity, following on obstruction of the ducts, *e.g.*, from calculus. Tuberculosis has been found in the enlarged glands in tuberculous patients, and syphilis has been blamed for the condition[11] in syphilitic patients, though the spirochæte has never been demonstrated. Cysts occasionally are found in these glands, *e.g.*, retention cysts and, adjacent to them, branchial and cervical cysts. Mixed tumours, lymphosarcoma, and secondary malignancy must also be excluded. The most difficult conditions to exclude from the syndrome are pseudoleukæmia and leukæmia. Acute inflammatory conditions, such as occur in mumps, typhoid, and secondary inflammations, such as follow abdominal disease or operation are, of course, easily excluded.

The changes in the structure of the gland which lead to its enlargement are as follows. There is an infiltration with lymphocytes, arranged in groups and strands in the intervals of fibrous trabeculæ, which also show scattered round-cell infiltration. The gland acini are scantily represented in scattered groups throughout, or may be completely absent. Eosinophiles and giant cells have been reported. The vascularity may be increased; endothelial proliferation, thickening of the vessel walls, and hyaline degeneration have been observed.

It is doubtful whether the increase in round cells is due to hyperplasia of the lymph nodules which are normally present, or is the result of chronic inflammatory infiltration. However, it seems probable that the acini are destroyed by pressure of the inflammatory infiltration rather than from a primary degeneration in the epithelial cells, and the lymphocytic distribution is later governed by the increase in fibrous tissue elements which may come from proliferation of the fibrous trabeculæ of the glandular structure or from the invading round cells.

However, in leukæmia, the lacrimal and salivary glands, with certain other glands such as the liver and kidney, are commonly infiltrated with lymphocytic cells, followed by cirrhotic changes with destruction of the parenchyma, though these changes never occur in myeloid leukæmia, as pointed out by Schaffer and Jacobson.[12]

Mikulicz described the condition as an entity, but later observers have departed from this and have reported under the terms "Mikulicz's disease" or "Mikulicz's syndrome" any case which showed chronic, bilateral enlargement of the salivary and lacrimal glands, no matter what its etiology, at the same time recognizing true "Mikulicz's disease". As is evident from the above histological description, it is most difficult to exclude leukæmia, and while it is probably true that in all cases of the syndrome occurring in leukæmia the lymph glands, spleen, or blood will serve to differentiate, it is conceivable that leukæmic manifestations may be first evident in the lacrimal and salivary glands. Howard (*loc. cit.*) states that the literature includes cases showing all gradations from the true Mikulicz's syndrome through pseudoleukæmia to typical lymphatic leukæmia. Certainly, such is not the usual course of the disease, but on this account he classifies cases showing Mikulicz's syndrome of idiopathic occurrence into three groups as follows:

1. Mikulicz's disease proper, in which the characteristic features of the syndrome are found as detailed above.

2. Pseudoleukæmia, in which in addition to the features found in group 1, there is enlarge-

ment of the lymph glands throughout the body, and possibly the spleen, but no other evidence of leukæmia.

3. Leukæmia, in which in addition to the features found in group 1 are the general enlargement of lymph glands and spleen, a typical leukæmic blood picture, and the other clinical features of a true lymphatic leukæmia, such as weakness and wasting.

This seems to be a rational view to adopt and is certainly very clear and definite as an aid in prognosis as well as in diagnosis.

SUMMARY

1. The case presented is typical of true Mikulicz's disease in its pathology, though the complete syndrome is not fully developed.

2. A similar syndrome may occur in tuberculosis, syphilis, plumbism, iodism, sialodochitis, and in lymphosarcoma and other malignant new growths in so far as these affect the lacrimal and salivary glands, but the term should be reserved to cover idiopathic cases.

3. Since the etiology of leukæmia is unknown, and the pathological picture cannot be distinguished from the true Mikulicz's disease, except that the only manifestation of the latter is in the lacrimal and salivary glands and their accessory glands, Howard's classification is most valuable in arriving at a conclusion as to prognosis, always excluding symptomatic cases.

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BLASTOMYCOSIS OF THE EYE*

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BLASTOMYCOSIS, or blastomycetic dermatitis, is a chronic disease of the skin, caused by a fungus, and of special interest to ophthalmologists because of the frequent involvement of the eyelids in the pathological process. It is found chiefly among labouring people, a larger proportion in males than females, and the age incidence varies from infancy to old age. Beginning as a papule or nodule which frequently breaks down, there is formed a characteristic indolent wart-like lesion, which later presents a raised papillomatous appearance. The general health of the individual is not as a rule disturbed.

The condition was first described by Gilchrist[1] in 1894, and the name "blastomycetic dermatitis" which he applied has been used by all subsequent writers. Six months later Busse published an account of a case of pyæmia, caused by a pathogenic yeast. Busche reported on this same case with especial reference to the skin lesions, and it is interesting to note that a purulent destruction of the cornea is among the pathological lesions mentioned. During the next few years a series of reports appeared. Ricketts[2] in his exhaustive article gives details of twelve new cases. This article is most complete, from clinical history to histopathology.

In reading through the case reports of most of the published cases, certainly of the earlier ones, one finds more or less obscure references to the involvement of the eyelids. Though no special references were made to this important feature of the disease, certain of the illustrations show extensive involvement of the lids and globe. For instance, in the summary of Case 2 in Rickett's series, the following appears: "The disease had extended over the left cheek to the

* Read at the Thirteenth International Congress of Ophthalmology, Amsterdam, September, 1929.

nose, had surrounded the left orbit, and involved both upper and lower eyelids; the cicatricial tissue producing eversion of the lower lid." Also in Case 3, "The region involved was recognized to be the left lower lid and the parts adjacent in both cheek and temple."

Gilchrist[3] in an article on "Blastomycetic dermatitis in the negro," gives photographs of two cases which show very extensive involvement of the lids. In both photographs marked ectropion of the lower lid an extensive involvement of the skin of the lids is easily made out. To Gilchrist belongs the credit of having first observed and described this skin disease in man. The importance of blastomycosis to ophthalmologists was emphasized by Wood[6] and Wilder[7] in 1904, and in 1915 Jackson[8] recorded two cases "of a disease hitherto supposed to be rare, and still inadequately noticed in the periodic literature and text-books on ophthalmology," and called attention to its clinical importance, the disastrous results through distortion of the lids, of failure to recognize it, and to its excellent prognosis under proper treatment.

A number of fatal cases have been recorded. Shepherd and Rhea[4] reported one from the Montreal General Hospital in 1911. The disease begins as a rule as a sluggish red papule. If there has been a preceding traumatism the wound does not heal, or only apparent healing takes place. No part of the skin surface is immune, but the local disease seems to have a special predilection for the lids. In nine cases reported by Pusey,[5] six showed lesions of the lower lid, and probably a quarter of the cases show affections of these parts.

Ordinarily, the primary papule becomes pustular in a short time, and the apex of the pustule becomes transformed into a crust, which when removed is seen to cover an irregular elevated reddened base, secreting a small amount of muco-pus. An early narrow red areola is very characteristic of the disease. Extension takes place steadily and in two to six months the lesion will have a diameter of one to two inches. The rough granular condition of the base now becomes greatly exaggerated, and gradually a coarse papillomatous or villiform surface results, the processes of which are separated by deep irregular clefts which are filled with pus. The appearance is sometimes cauliflower-like, the verrucose tissue rising sharply above and overhanging the surrounding skin (Fig. 1). In

FIG. 1.—Blastomycosis, showing involvement of the lids.

other cases the papillomatous tissue is more flattened and shows little of the cauliflower appearance. This is always the case during the process of healing. The characteristic skin areola, red or bluish red, rises somewhat to meet the base of the ulcer, and possesses an unbroken horny layer, studded with numerous sub- or intra-epithelial abscesses. These appear as minute yellowish points. If they are pricked they yield a droplet of sticky pus in which the organisms are easily demonstrated in large numbers. Sometimes the centre loses its papillomatous surface and becomes depressed below the level of the surrounding tissue, either moist, red, and granulating, or dry with cicatricial healing.

In most cases the disease progresses rapidly with periods of comparative quiet. During the extension period of the disease the whole surface is swollen, red, and secretes an offensive pus freely, while the areola becomes broader, more turgescent, and contains a larger number of abscesses. The pus from these is decidedly bloody. During the quiet intervals the surface

flattens, is drier, the areola narrower and flatter, with fewer abscesses, which now contain little or no blood. The disposition of the disease to creep gradually from the point of origin to distant areas is well illustrated in certain cases.

Though the rough granular condition of the base, with coarse papillomatous or villiform surfaces, the processes of which are separated by deep irregular clefts filled with pus, presents a typical clinical picture, all writers emphasize the necessary differentiation from epithelioma, tuberculosis, lupus, and late syphilis of the ulcerative or warty type. To these we must add sporotrichosis and the condition caused by the *Coccidiodes imitis*. The clinical history and appearance of many of the cases of blastomycosis are such as to readily indicate their character. Nevertheless, the diagnosis ultimately rests on the finding of the organism.

From a suspected lesion of blastomycosis, a diagnosis can often be made by a smear preparation from the purulent exudate, in the ulcer itself, or from the small superficial abscesses in the skin about the ulcer. The pus is placed upon a slide, and it is often helpful to add a few drops of a deci-normal solution of sodium hydroxide. This clears the exudate, and brings out sharply the double contour of the yeast bodies. The prepared smear is first examined with the high dry lens, when the organisms will be seen in sharp outline as doubly contoured round bodies about two to three times the size of a pus-cell. The organisms in the majority of cases can be demonstrated in sections made from material obtained by biopsy. In our experience the best results have been obtained after fixation in Zenker's solution with embedding in paraffin. The organisms stain readily with the ordinary laboratory stains, but the best one to use is Mallory's connective-tissue stain. With this the body of the organisms stains red, and the periphery a deep blue. We have seen a number of cases, evidently blastomycosis, in which the organisms were demonstrated only after many examinations, or not at all. Cultivation may be easily obtained on the ordinary artificial media, such as glycerin or glucose agar. The best media however is Sabouraud's 4 per cent glucose agar. At room temperature the growth shows itself in two to eight days, but growth may be slow, so that tubes should be kept for two to three weeks before discarding them as negative. The growth on agar appears as whitish colonies like *Oidium lactis* and grows as hyphæ, not by the formation of yeast cells. One sometimes sees the hyphæ spreading out on the surface of the test tube at the margin of the medium. On different media the organisms send out mycelia with lateral buds or coccidia. The most satisfactory way of studying the mycelia by staining, as recommended by L. J. Rhea, is first to grow the organism on a solid medium, preferably agar. Then cut out a block of the agar, containing a portion of the colony, fix it in Zenker's fluid, imbed and stain with Mallory's phosphotungstic acid-hæmatoxylin. Also very beautiful permanent films may be made by carefully placing the mycelium on a slide which has been covered with a thin layer of egg albumen: Before drying has thoroughly taken place fix in Zenker's fluid and then stain the fixed specimen with phosphotungstic acid hæmotoxylin.

The pathological changes in the skin consist in an extensive keratosis, accompanied by an inflammatory reaction of the granulomatous type, with presence of the yeast cells within the giant cells or free in the tissues. Very rarely does one see the mycelium in human cases, contrary to what occurs in the culture, which is composed of mycelium.

The treatment of cutaneous blastomycosis consists in the administration of the iodide of potassium in heroic doses of from two to four hundred grains a day. By this means the lesions can be reduced, if not completely cured. The use of the roentgen rays also causes the disappearance of the lesions, and a favourite treatment is a combination of both. Local abscesses are, of course, treated on ordinary surgical principles.

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SUBACUTE MALIGNANT ENDOCARDITIS*

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THIS type of endocarditis is caused by the *S. viridans* which attacks valves which have previously been damaged, usually as a result of rheumatic fever. It runs its course in from two months to one year, and with few exceptions the cases terminate fatally. An increase in the frequency of the disease during the past year has prompted the writer to report briefly some few cases and to draw attention to interesting features, particularly emphasizing points in diagnosis.

As has been stated, the *S. viridans* usually attacks valves previously diseased or deformed congenitally. Horder (quoted by Schlesinger)[1] reports 80 per cent and Blumer 43 per cent of cases as having previous valvular disease. In a small group of 14 cases in which the history and physical findings were carefully investigated by the writer seven, *i.e.*, 50 per cent, were found to have previous valvular disease, one being a case of pulmonary stenosis. The causative organism is recovered from the blood during the course of disease in a fair percentage of cases. Different investigators report different results. Hedley Wright[2] obtained positive blood cultures in 12 out of 19 cases. Clawson and Bell[3] recovered *S. viridans* in 22 out of 80 cases. In a small group of nine cases of this series, examined repeatedly, only three showed positive blood cultures.

From the standpoint of pathology we are dealing with an endocarditis. The myocardium shows in the majority of cases the Bracht-Waechter lesions—round-celled infiltrations in areas where muscle fibres have undergone degeneration or necrosis. These are usually scattered, small, and without significant effect upon ventricular conduction. The vegetations formed on the valves are soft, friable and easily give rise to emboli. In the less severe types of the disease the valves show evidence of healing, and in a very small percentage of cases healing with recovery takes place. Emboli frequently cause blocking of arteries of various sizes in the brain, spleen, kidney, skin and muscles.

Fifty cases of endocarditis have been admitted to and treated in St. Michael's Hospital during the past five years. Of these, 18 cases are classed as subacute malignant endocarditis. Half of these cases have been encountered during the period from January to October, 1928.

CASES OF ENDOCARDITIS AT ST. MICHAEL'S HOSPITAL 1924–1928 INCLUSIVE

Year	*Total*	*Subacute bacterial endocarditis*
1924	9	3
1925	11	1
1926	7	2
1927	11	3
To October, 1928	17	9

The following summary of the findings in 14 recent cases, which form the basis of this paper, will serve to draw attention to the signs and symptoms upon which a diagnosis may be based.

Age. — Twenty-one to forty-five; average, thirty-one and a half years. In[4] a series reported from University College Hospital, London, England, 33 was the average age at death, and only four out of sixty cases coming to autopsy were under 15. Horder states that 8 per cent, and Osler 2 per cent, of cases are found in children.

Sex.—Seven men and seven women.

Previous illness.—Rheumatic fever in seven cases; congenital heart disease in one case.

Onset.—Usually insidious with malaise, weakness, loss in weight, fever, and, in the more severe infections, chills and sweating. In milder cases the symptoms exist for weeks or months before advice is sought.

Fever.—May be low grade, 99°F. to 100°F. In more severe cases it ranges from 100° F. to 103° F.

Heart.—Enlarged and leaking at one or more valves. The valves are involved in the same relative frequency as in rheumatic fever;

* Read before the Section of Medicine, Academy of Medicine, Toronto, October 9, 1928.

mitral valve first in order of frequency, then aortic, tricuspid and pulmonary valves in the order noted. Fibrillation was noted in three cases; in one during the acute febrile stage, in a second while the patient was afebrile, while in the third case paroxysmal fibrillation with fever and petechiæ occurred on the least excitement.

Spleen.—Palpable in eight cases (55 per cent). According to some writers it is palpable in over 80 per cent of cases.

Joints.—Joint pains frequent and variable; joints never swollen nor red.

Fingers.—Clubbing was noted in only two cases. Many writers state that this is a cardinal symptom. Schlesinger[5] places the frequency at 35 per cent.

Anæmia.—Some degree of anæmia is always found. It may be severe. In one case of this series the first examination showed hæmoglobin 34 per cent, red corpuscles 2,900,000 per c.mm.

Leukocytes.—Ranged from 6,000 per c.mm. to 12,600.

Blood cultures.—Positive in three out of nine cases examined.

Embolism.—Frequent. In ten of the 14 cases here described it occurred at some time during the course of the disease (71 per cent). In four of the cases death occurred as a result of a "stroke," probably due to embolism in the middle cerebral artery, and in none of these cases was consciousness regained after the stroke occurred.

CASE 1

Mrs. S. R., aged 45, was admitted to hospital on March 25, 1928. She had had frequent attacks of tonsillitis as a child but no definite history of rheumatic fever. She had come from Fort William to have a goitre removed, but routine examination revealed: (1) an enlarged heart leaking at the mitral valve. (2) A non-toxic adenomatous goitre. (3) Severe secondary anæmia; hæmoglobin 34 per cent; red corpuscles 2,900,000; leukocytes 8,000; polymorphonuclears 82 per cent; lymphocytes 14 per cent; eosinophiles 1 per cent; and endothelials 3 per cent. (4) Enlarged, easily palpable spleen. (5) Low grade fever (99° F. to 100° F. in the evening).

On April 3rd pain of sudden onset was complained of in the calf of the left leg, and at the centre of the calf muscle there was marked tenderness. Both these symptoms disappeared in four or five days. Three blood cultures were sterile. A diagnosis of subacute malignant endocarditis was based upon the low grade of fever, anæmia, enlarged spleen, enlarged heart with organic mitral lesion, and the occurrence of embolism in a small artery of the left leg.

With rest in bed, combined with liver diet, the patient became afebrile and the blood count reached 4,000,000. Since going home she has had low grade fever but reports that the blood count is staying up and that her general health is improved.

CASE 2

G. B., a salesman, aged 36, came to hospital on February 10, 1928, complaining of weakness and loss of weight since January 1, 1928. He had had typhoid fever in 1908, and was known to have had a heart murmur then on account of which he was refused enlistment in the army. He stated that in addition to the symptoms noted above he had had night sweats on several occasions. His friends had told him that he was getting pale.

On examination it was found that he had a temperature of 100° F. to 101° F.; pulse 66 to 80; spleen palpable; a rough mitral systolic murmur; mild secondary anæmia; hæmoglobin 83 per cent; red corpuscles 3,712,000; leukocytes 7,200 per c.mm.; lungs normal; urine normal. On his left forearm just above the wrist there was a palpable tender subcutaneous node which had appeared suddenly; this disappeared in four or five days. A diagnosis of subacute bacterial endocarditis was made, based upon the history of previous valvular disease, fever, anæmia, mitral bruit, enlarged spleen and embolism at the left wrist.

This man became progressively worse; fever ranged from 99° F. to 102° F., was septic in character and accompanied by severe sweating. Frequently there was evidence of embolism in the arteries of the skin, the muscles of both lower extremities and the conjunctivæ, with sudden pain and formation of a palpable node if the artery was superficial. Pain and tenderness came suddenly, lasted three or four days, gradually subsided, and finally disappeared. Sweating at night was marked; wasting was rapid. Pains in various large joints were troublesome at times. Fibrillation of the heart was noted and proved by an electrocardiogram by Dr. Oille in March. Toward the end of April, 1928, the patient had an apoplectic seizure due to hæmorrhage or embolism, and died one week later without recovering consciousness, after an illness of four months. Of special note is the occurrence of fibrillation during an active stage of the disease.

Libman[6] reports that of four cases of auricular fibrillation in 61 cases examined by electrocardiograph, only one occurred during an active stage of the disease, the rest when the patient was in the bacteria-free stage. This patient was febrile and, judging from the numerous emboli, certainly not bacteria-free, yet he had auricular fibrillation.

Broughton[7] states that the apoplectic seizures, supposedly due to embolism, are in reality due to hæmorrhage from rupture of an aneurism of the artery supplying the internal capsule. In support of this view he reports having done autopsies on some sixteen cases of subacute malignant endocarditis among soldiers where a stroke was followed by death, and in every instance cerebral hæmorrhage was found instead of cerebral softening following embolism. The aneurism follows, it is said, on small emboli lodging in the vasa vasorum with consequent weakening and dilatation of the arterial wall

which may eventually rupture. This seems to have happened to one of the gluteal arteries in the following case.

CASE 3

K., a male, aged 30, was seen in consultation with Dr. G. W. Pringle, September 12, 1928. He had had rheumatic fever at the age of fourteen and again in the army in 1915, when he was told he had a bad heart, was given a pension, and discharged. He never recovered his former health after this attack in 1915. Taking ill with exhaustion, fever, chills, loss of weight about May, 1928, while in Florida, he was told he had malaria. He came home in June, 1928, and had been in bed ever since with fever, chills, sweats, marked loss of weight, exhaustion, enlarged spleen and emboli from time to time. At the time of consultation there was an Osler's node on the right forehead, enlarged spleen, enlarged heart leaking at both mitral and aortic valves and a pulsating tumour over the right buttock about centre of ilium. He stated that sudden pain radiating down the back of the leg had come in this area about two weeks previously and had persisted. On palpation, there was tenderness with pulsation over the area about one inch in diameter. In view of emboli elsewhere, on the forehead, in the hands, etc., this was thought to be an aneurism of one of the gluteal arteries following embolism of the artery, or aneurismal dilatation consequent upon embolism of one of the vasa vasorum. In view of his pain the former explanation seems most likely.

In this case it is worthy of note that the patient had a gluteal aneurism, and that the first diagnosis was malaria owing to the fact that he was in a district where malaria was prevalent in the spring of the year, and that he had daily fever with chills, sweats, exhaustion, loss of weight, and an enlarged spleen. The fact of embolism in various places, and the obviously diseased heart, should soon have altered the preliminary diagnosis of malaria, which moreover would have been finally excluded by the failure to find malarial parasites in the blood. This patient died in November, 1928.

CASE 4

F. de F., male, aged 22, came to hospital on August 21, 1928, complaining of periodic pain in the left side of the abdomen since June, 1928; pains in various joints; and shortness of breath. He gave a history of rheumatic fever at fourteen, and attendance at Out-Patients' Department for heart trouble five years ago. He stated he had been in good health until June, 1928, when he went down, with "la grippe," and was told that his heart was bad. At the end of four days' rest, however, he went back to work. In two weeks' time he was again in bed with pain in the left side of the abdomen. This attack lasted a week, and then he was admitted to hospital in New York. In one week's time he left hospital and came to Toronto on August 1, 1928. Pain in left side of abdomen recurred, also fleeting joint pains, and he came into St. Michael's Hospital on August 21, 1928. During the first week in hospital there were found: (1) irregular fever, ranging from 99° to 100°; (2) a pulse of 86 to 100; (3) a palpable spleen; (4) urine; + casts, a few red blood cells and some white blood cells; (5) red blood cells 4,260,000 per c.mm.; white blood cells 12,600 per c.mm. (6) heart; aortic, systolic and diastolic bruits, and mitral regurgitation; (7) Osler's nodes; (8) sterile blood cultures.

His course was steadily downward; fever persisted and became higher; there was marked sweating at night; weakness and pallor increased. On September 9, 1928, he suddenly became unconscious and paralyzed in the left side of the body. He did not regain consciousness and died on September 11, 1928.

Of special interest here is the history of pain in the left side of the abdomen. This was undoubtedly due to infarction of the spleen. Similar cases have been treated surgically, but such an untoward event could easily be prevented by noting the diseased heart, the anæmia, slight leukocytosis, and irregular fever. The writer recalls a case with pain in the right upper quadrant which was operated on for acute gall-bladder disease. The probability is that the surgeon failed to examine the heart, which was much enlarged and leaking at the aortic valve, and was misled by tenderness and rigidity of the right upper rectus as the result of an embolus in one of its arteries.

CASE 5

W. J., a male, aged 23, was admitted to hospital, November, 1924, with shortness of breath, cyanosis, and clubbed fingers and toes. Fever was absent from the time of admission November 30, 1924, to January 24, 1925, except on December 6th, January 4, January 23, when it was 99.3° F. From January 24 to January 29 it ranged from 99° F. to 102° F. This was thought to be due to acute tonsillitis. It was normal then until February 19, 1925, when he was sent into isolation for diphtheria from which he recovered. Physical examination on admission showed hæmorrhages on legs, neck, chest and arms; liver enlarged; heart slightly enlarged, with a systolic bruit heard all over the precordium; spleen not enlarged; urine showed red blood corpuscles, pus cells, casts and a trace of albumin; blood, 140 per cent hæmoglobin and 12,150,000 red blood corpuscles per c.mm. He had a stroke on May 3, 1925, and died in twenty-four hours. Post-mortem examination revealed pulmonary stenosis; patent foremen ovale; subacute bacterial endocarditis on mitral, pulmonary and tricuspid valves.

In a series of 150 cases of subacute malignant endocarditis Horder (quoted by Clarke)[9] reports 8 as having congenital heart disease. It is also noteworthy in this case that the opening in the pulmonary valve was only such as would admit a small probe, and yet sufficient aeration of the blood took place to maintain life and would have done so for some time, in all probability, if he had not had a stroke.

CASE 6

H. L., a male, aged 45, fractured his left olecranon process and was admitted to hospital on January 7, 1922. His previous medical history was negative. Examination showed pallor and low grade fever (99.5° F. to 100° F.) He had a moderate grade of anæmia; red blood corpuscles, 3,400,000 per c.mm.; leukocytes, 7,200 per c.mm.; hæmoglobin 60 per cent. His spleen was not palpable. There was no sign of embolism nor petechiæ. His heart showed a blowing systolic mitral murmur; apex, one inch outside the mid-clavicular line. Against advice he left hospital on January 25, 1922.

Blood cultures on February 3 and February 17, 1922, yielded *S. viridans*. He was readmitted to hospital on March 1, 1922, at which time he was afebrile. Exsanguination transfusion was performed on

March 13, 1922, after which his red cells were 4,000,000 and his hæmoglobin 40 per cent. On March 28, 1922, and April 6, 1922, blood cultures were sterile. On the latter date his red cells were 4,400,000, and his hæmoglobin 63 per cent.

On January 3, 1923, his blood count showed 4,400,000 red cells; 5,600 leukocytes, and 67.5 per cent hæmoglobin. Blood cultures sterile. Spleen not palpable.

The patient was re-examined on September 24, 1928. He looked well and had been working steadily since 1923. His heart was normal in size but, showed roughening of the first sound and a slight systolic bruit at the apex. His blood showed 70 per cent hæmoglobin and 5,200,000 red cells. *His spleen was now palpable.* Urine was normal. He was apparently cured.

This case[10] was reported previously as a cure. It belongs apparently to that group of mild cases such as had been reported by Graham, Oille and Detweiler[11] in 1915 and 1924.[12] It is interesting to note that this patient's spleen is now palpable and his hæmoglobin normal.

	Subacute Malignant Endocarditis	*Rheumatic Endocarditis*	*Septic Endocarditis*
1. *Onset*	Insidious	Sudden	Sudden
2. *Age*	Adults	Children	Adults or children
3. *Sex*	Both sexes	More common in girls	Both sexes
4. *Pyrexia*	Low grade	Varies, often high	Septic type
5. *Heart*	Endocarditis No pericarditis	Endocarditis and pericarditis	Endocarditis
6. *Lungs*	No pleurisy	Pleurisy	No pleurisy
7. *Spleen*	Enlarged in 85 per cent	Enlarged in 15 per cent	Occasionally enlarged.
8. *Kidney*	Nephritis	No nephritis	Embolic abscesses
9. *Joints*	Fleeting pains	Red, swollen and painful	Not involved, unless in gonococcal endocarditis
10. *Emboli*	Osler's nodes	None	Septic emboli
11. *Clubbing of fingers*	in 35 per cent	in 4 per cent	Absent
12. *Hæmorrhages* ...	Conjunctivæ-retina 43 per cent	in 8 per cent	Conjunctivæ
13. *Blood culture* ...	*S. viridans*	Streptococcus (Clawson and Bell)	*S. hæmolyticus*; Streptococcus; Pneumo coccus; Gonococcus
14. *Leukocytes*	6,000 to 12,000 per c.mm.	High	High
15. *Urine*	Red blood cells	Normal	Pus cells
16. *Duration*	2 to 12 months	Variable	Short
17. *Outcome*	Fatal (occasional recovery)	Recovery usual	Fatal

DIAGNOSIS

Mild cases of this disease may be mistaken for early tuberculosis, neurasthenia, typhoid fever of a mild degree, and the more severe cases for pernicious anæmia, malaria, and other forms of heart disease, principally rheumatic carditis or endocarditis due to pneumococcus and streptococcus hæmolyticus. A complete history, physical examination, laboratory and x-ray examinations, and a period of observation, will clear up the diagnosis in nearly all cases. One should be especially on guard against diagnosing the mild cases as neurasthenia and the more severe cases as pernicious anæmia or malaria.

The following chart illustrates the main features of the common forms of acute endocarditis:

In subacute malignant endocarditis the prognosis is very grave; only 1 case in this series is known to have recovered. Libman[13] reports 10 cases as having recovered, 4 of these occurring in the first one hundred and fifty cases of the usual type. Treatment is of no avail. Our main hope lies in being able, some day, to prevent rheumatic fever. Much heart trouble would, I believe, be avoided if parents were instructed to put their children to bed as soon as they developed sore throat or a cold in the head. Not only could the heart be spared but various complications in the middle ear, sinuses, antra and lungs would be fewer.

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PSEUDOMYXOMA PERITONÆI SECONDARY TO OVARIAN CYSTADENOMA*

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PSEUDOMYXOMA peritonæi, which is frequently referred to as "mucous ascites," is a condition of the peritoneum in which masses of gelatinous pseudomucinous or mucinous material are distributed over its surface, either as a homogeneous layer or in the form of multiple cystic masses. The abnormal semi-fluid material in most cases invades the peritoneal cavity as the result of rupture of a pseudomyxomatous cystadenoma of the ovary, or of a mucocele of the appendix. The reception of the material by the peritoneum may be purely passive, or the response may be by generalized peritoneal thickening, cellular infiltration, the formation of connective tissue producing firm adhesions, proliferation of secondary tumours, and the formation of multiple cysts, or by a combination of all of these. It is not uncommon to find the reaction of the peritoneum differing in various parts of the abdominal cavity. The gelatinous material may be coloured in various shades of red, yellow, brown, and grayish white, depending on the amount of hæmorrhage, fatty material, cholesterol, and cellular detritus that occurs within the cystic masses.

Werth[28] is generally credited with having given the first description of this condition in 1884, but Peon[19] (1871) probably referred to it in speaking of "myxomatous degeneration of the peritoneum." Olshausen[18] and Wendler[27] were early writers on the subject. In 1901, Fraenkel[7] reported a case occurring in a male patient as the result of rupture of a mucinous cystic appendix. Since then, Wilson,[29] Dodge,[5] Trotter,[26] Seelig,[23] Novak,[17] and others have reported cases in which the appendix was the original cause of the condition. McCrae and Coplin[15] reported a case in which they considered the gall-bladder to be the organ originally involved. Giardina[8] considered a diverticulum in the cæcum to be the starting point in a unique case of his. Ries[21] referred to a case, reported by Lauche, in which the growth originated from an umbilical tumour which, in turn, developed from a persistent portion of the omphalomesenteric duct. Other writers mentioned the possibility of pseudomyxoma peritonæi originating from retroperitoneal structures, but we could not find any authentic cases in the literature. The condition was experimentally produced by Naeslund[16] in young rabbits by ligating the appendix and cutting it just distal to the ligature.

The etiology of pseudomyxoma peritonæi is still in doubt. Pseudomucinous cystadenoma of the ovaries is relatively common under forty years of age, but pseudomyxoma peritonæi is seldom seen before that age. Ahlström[1] says that 84 per cent of the latter occur after forty years of age. In our series, 80 per cent of the patients were older.

Pseudomyxoma peritonæi is relatively rare. It is most often seen in women, associated with, and secondary to, ruptured pseudomucinous cystadenoma of the ovary. The co-existence of a pseudomucinous cystadenoma of an ovary and a cystic appendix has been frequently reported in cases of pseudomyxoma peritonæi. The finding of a point of rupture in one or the other would determine which was primarily

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the cause of the peritoneal invasion. Chemical examination might also be of value, as it has been stated by Trotter that the material from the appendix is always acid in reaction, whereas that from the ovary is alkaline.

Instances have been reported in which pseudomyxoma peritonæi apparently developed several years after the removal of a pseudomucinous cystadenoma. Lehmann[11] stated that he had known the condition to occur ten years after removal of the primary ovarian tumour. Olshausen[18] reported one case that occurred seventeen years after removal of the ovarian tumour, and Lewis[12] reported one, twenty-two years after the primary operation. Mayfield,[14] in a detailed analysis of 100 cases of papillary cystadenoma, found 6 cases in which pseudomyxoma peritonæi developed in spite of the fact that the capsules of the ovarian tumours were said to be intact at the time they were removed.

There has been much debate as to the mechanism by which the pseudomyxomatous condition of the peritoneum develops. Some of the older writers suggested that the peritoneum itself undergoes myxomatous degeneration, producing the mucin or pseudomucinous material. The accepted theory at present is that metastasis or implantation of epithelial cells from the lining of the original cyst produces the secondary condition. After spontaneous rupture, pseudomucinous material is believed by Hertzler[9] to pass into the peritoneal lymphatics. Lehmann[11] suggests that the disease might be spread by the rupture of a cyst into a blood vessel. Such an accident would account for Polano's case,[20] in which secondary cysts were found in the portal vein, in the liver, and in the lymph nodes.

Pseudomucinous cystadenomas may be benign or malignant. When they are malignant, the malignancy is usually of a low grade, and if the patient's condition warrants exploration, we agree with Deaver[4] who says that both ovaries and as much of the fluid as possible should be removed. A secondary operation sometimes is advisable, with good hope of prolonging life in comparative comfort. In an excellent article on the subject, Taylor[25] quotes Stuebler and Brandess as stating that only 6.7 per cent of pseudomucinous cystadenomas of the ovary are malignant, and that only 2.07 per cent of the others produce pseudomyxoma peritonæi. Taylor carefully reviews 139 cases of ovarian tumours. He found 6 cases of benign papillary pseudomucinous tumours, 5 cases of mucous carcinoma graded 1, and 3 cases of carcinoma pseudomyxoma peritonæa graded 1, secondary to ovarian tumours.

Pseudomucinous ovarian cysts are prone to be bilateral. Lehmann says that when an ovary has been removed for a pseudomucinous cyst and the other ovary looks normal at the time, the same condition will develop in the other ovary in 30 per cent of the cases. Ewing[6] says that the condition is bilateral in 17.7 per cent of cases.

Hertzler[9] divides pseudomucinous ovarian cysts into those with glandular and those with papillary structures. Taylor considers them all to have been multilocular in structure originally, and most of the papillary-like processes found in them to be the result of rupture of interlocular partitions; he believes the rupture to be the result of excessive dilatation. In other cases, true papillomas are formed by sprouting of epithelium, and in some cases they are extra-cystic as well as intra-cystic. MacCarty[13] concluded from his histological studies of ovarian cysts that they all start from the stratum germinativum of the ovary. He found a small ovarian cyst in the lining of which were areas of many layered epithelium, similar to that found in Graafian follicles and simple cysts, other areas of columnar epithelium resembling the structure of cystadenoma, and still other areas with papillomas; from these he concluded that papillary cystadenoma might develop. Taylor said: "In 1920, it was a prevailing belief that ovarian tumours were all ovarian in origin, the serous, ciliated tumours coming directly from the germinal epithelium, and the pseudomucinous cysts from the germinal epithelium, either by a short process of metaplasia or the longer one of passing through the ovum stage and being ovulogenic, that is to say, teratomatous in origin." Sampson's[22] theory of endometrial transplants in the ovary, as Taylor suggests, offers an entirely different theoretical source for the origin of ovarian tumours, and the possibility that some of them have their origin in ectopic endometrial tissue has to be considered. Recently we operated on a case, reported by Dawley, in which there was a cystadenoma in the anterior uterine

wall, the lining cells of which resembled the cells in the endocervix, and the acini were filled with a clear mucinous material.

The histories of 30 cases of pseudomyxoma peritonæi secondary to ovarian tumours seen in The Mayo Clinic during the last 18 years were reviewed. During the same period 6,865 benign and 950 malignant tumours of the ovaries were operated on. The 30 patients had 54 operations, some elsewhere, and some in the clinic. In 28 of the cases microscopic examination of the tissue removed at the clinic showed 12 (43 per cent) of the growths to be malignant, and 15 (57 per cent) to be benign. The youngest patient was 29 years and the oldest was 63 years of age; 13 cases occurred between the ages of 50 and 60 years and the average age for the group was 49.9 years. Twenty-eight of the patients were married, and 21 of them had had children. Of 25 cases in which the menstrual history was given definitely, in 84 per cent menstruation was normal, and in 16 per cent there was a history of some irregularity previous to the menopause. Three patients had a family history of malignancy, but in only one was cancer found at the time of operation at the clinic.

SYMPTOMS

The condition apparently gives little or no inconvenience until enlargement of the abdomen is noted. As a rule, this is very gradual, but three patients who came to the clinic noted rapid distension. As pressure increases, such symptoms as bearing down, urinary frequency, and shortness of breath, develop. Pain is the symptom next most frequently complained of and was noted in 50 per cent of the cases. In some of the cases, this was probably due to other conditions, as five patients had stones in their gall-bladders as well as pseudomyxoma peritonæi. Bloody vaginal discharge was complained of in four cases. In one case this was due to a degenerating cystadenoma implanted in the fundus of the uterus. Two patients gave a history of peritonitis, and at operation they were found to have fistulæ between the cysts and the intestinal canal. One of them gave a history of diarrhœa and the passage by rectum of a considerable amount of mucoid-like material.

Most of the patients had had symptoms for more than eight months before coming to the clinic, but one had been free of any suspicion of trouble until ten days before she arrived in Rochester. There is no doubt that many of them had large symptomless tumours for a considerable length of time before trouble was suspected.

General examination of the patients usually revealed large, cystic, pelvi-abdominal tumours. In some cases, it was impossible to tell whether a tumour was present or whether the distention was due entirely to ascites.

In the majority of cases there was mild secondary anæmia, with hæmoglobin averaging about 65 per cent; the lowest reading was 31 per cent. This low reading was in a patient 29 years of age, who, in addition to carcinomatous pseudomyxomatous peritonæi, had localized peritonitis as the result of rupture into the terminal ileum.

At operation, all the patients were found to have large quantities of gelatinous material free in the peritoneal cavity. In one case of intra-cystic and extra-cystic carcinomatous papillary pseudomucinous cystadenoma, eight gallons of fluid and semi-fluid material were removed from the abdominal cavity and the patient is still alive four years and eight months after operation; however, there is some question of recurrence at the present time. In some cases, there were secondary cyst-like masses attached to the parietal and visceral peritoneum, with extensive, firm adhesions. In several cases, the wall of the bowel appeared to be involved, and in separating adhesions and attempting to remove the material, great care had to be exercised not to injure the bowel. Injury to the intestine occurred in two cases, and resection of the small bowel was necessary in one of them. Infected pseudomucinous cystic areas were found in two cases as the direct result of the new growth extending through the intestinal wall. In ten of the cases, the omentum was especially mentioned as showing marked involvement and in four cases it was thought best to remove it entirely. In two cases mucocele of the appendix also was present. Besides the removal of the involved organs, as much of the gelatinous material as possible was removed at each operation.

The disease was bilateral in 15 cases; limited to the right side in 9 cases, and to the left side in 5 cases. In 2 cases, in which the disease

was bilateral, a carcinomatous pseudomucinous cyst was present on one side, and a benign pseudomucinous cyst on the other side. When the condition is malignant there is a definitely increased tendency for the involvement to be bilateral. In our series in 73.3 per cent of the cases in which involvement was bilateral the condition was malignant.

There were 5 post-operative deaths following 39 operations, a mortality rate of 12.8 per cent. Fifteen (50 per cent) of the patients had been operated on for this condition before coming to the clinic. In some instances a drain had been employed, resulting in secondary infection and firm adhesions. Two of the deaths were from pulmonary embolism, and three from peritonitis. At the time of operation, two of these patients had peritonitis as the result of spontaneous perforation of the intestine, and were considered as very poor risks.

When a microscopic examination of the tissue removed shows no evidence of cancer, the outlook is good for permanent cure, but two or three operations are sometimes necessary. One patient is alive almost twelve years after three operations. Bland-Sutton[2] reported a case in which he operated three times, and the patient apparently was free from symptoms three years after the last operation. When a malignant condition is diagnosed, it is usually of a low grade, according to Broders' classification. Both ovaries and tubes, as much as possible of the pseudomucinous material, and, as a rule, the uterus, should be removed, and extensive treatment with radium and roentgen rays should be given. If advisable, a secondary operation should be undertaken to remove as much as possible of the involved tissue. By employing the measures outlined, all these patients get a considerable extension of life and some are cured.

SUMMARY AND CONCLUSIONS

1. The largest number of cases of pseudomyxoma peritonæi of ovarian origin was found in patients in the sixth decade of life. The average age was 49.9 years.

2. Swelling of the abdomen and pain are the two most constant symptoms. The average duration of symptoms before operation was less than one year.

3. On general examination a pelvic-abdominal mass or masses usually are found. A large, tense abdomen with a fluid wave, questionably present on palpation, may be the only abnormality found.

4. The right ovary was involved more frequently than the left in this series.

5. There is a higher percentage of bilateral involvement in the cases of ruptured pseudomucinous cystadenomas, especially in those of papillary type, in both benign and malignant cases.

6. Pressure phenomena are responsible for many of the symptoms of which complaint is made.

7. Pulmonary embolism and general peritonitis, as the result of involvement of the wall of the bowel, were the chief factors in the operative mortality.

8. Permanent cures are frequently obtained in both the benign and malignant cases, but naturally the prognosis is better in benign cases.

9. Frequently it is advisable to remove both right and left ovaries and the appendix, and in some cases, the uterus and the omentum should be removed as well.

10. As much of the gelatinous material as possible should be manually removed from the abdominal cavity at the time of operation.

11. Radiotherapy should be tried in all cases.

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THE EDUCATION OF ABNORMAL CHILDREN*

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GENERAL CONSIDERATIONS

THE mental disorders of childhood are numerous and varied. The arrests of development are beyond question the most common, and are grouped ordinarily under three categories—idiocy, imbecility, and feeble-mindedness. The idiot and the lower imbecile are quite at the bottom of the scale, and the almost complete absence of intelligence in them precludes all possibility of their receiving a practical education. The higher imbecile and the feeble-minded are the types that we shall consider here particularly.

These are patients presenting more or less marked intellectual deficiency, but who are, nevertheless, always capable of new acquisitions. The higher imbecile has the mentality of a child of from five to seven years; he is able to express his thoughts orally in a satisfactory manner, but he writes only laboriously; he is capable of executing delicate work, and education transforms him into a useful individual in our institutions. The feeble-minded person has a mental age of from seven to twelve years; he can speak and write correctly. On the other hand, his power of attention is quickly fatigued, and his judgment and acquisitive faculties are more or less inadequate. He does not, therefore, have the intellectual capacity necessary to keep up with the general progress of the children of his age in the common schools; he is quickly distanced by the others and benefits very little from the present day rapid methods of teaching. He ends by becoming discouraged and completely disinterested in his scholastic duties. His parents are soon forced to withdraw him, and the child, deprived of the normal interests of his age, becomes idle, vagrant, and sometimes criminal. It is estimated that there are some 60,000 of these feeble-minded in Canada. The École La Jemmerais, situated near Quebec, receives those belonging to our Province.

ETIOLOGY

What then, is the cause of these mental disorders of childhood? In the case of four hundred applications for admission to our institution we hav enquired into the etiological factors mentioned by the authors. The personal antecedents most often mentioned are: infantile convulsions, meningitis, tuberculosis, traumatism, infectious fevers, in the first rank of which we must place scarlatina, diphtheria, and typhoid. Hereditary antecedents are also very common, and those which we have noted oftenest are mental alienation, alcoholism, tuberculosis, syphilis, and consanguinity. These arrests in intellectual development are often associated with encephalopathic lesions of intra-uterine life or early infancy, involving the different psychic areas, motor, sensory, and perceptive. Feeble-mindedness is, then, often associated with physical disorders, to particulars about which we shall return shortly.

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Translation by A.G.N.

DIAGNOSIS

How can we recognize these states of retardation? Idiocy and marked imbecility cannot be mistaken, but the diagnosis of feeble-mindedness is always much more difficult.

Let us recall, first of all, in the case of the feeble minded his disorders of voluntary attention and judgment, his inaptitude for learning, which was mentioned above. These symptoms are purely psychiatric and submitted to the personal appreciation of the examiner; they give rise to a simple clinical impression. About 1900 Binet and Simon[1] undertook in France the systematic study of this affection and placed the world under obligation to them on account of their celebrated tests for the estimation of intelligence, which everybody has long been acquainted with and uses every day. These tests were the first really scientific means for establishing the intellectual level of an individual. Since they were first described they have been modified or augmented by different authors, but the basal principles remain the same.

The tests in general establish a definite mental age, but they constitute only one element in the diagnosis, and one should realize that a mental age inferior to the chronological age does not necessarily indicate an arrest of intellectual development, and that different abnormal states are to be distinguished.

One should always keep in mind the possibility of *simple mental retardation,* not pathological; this is the case where certain children have missed school because, on account of physical infirmities or other unfortunate conditions, they have been unable to follow the curriculum and develop their different faculties. It is, perhaps, here where the study of *motor debility* presents the most interesting diagnostic problem. We have seen above that arrests of development frequently manifest themselves in the mental, physical or perceptive domains. Dupré[2] has described the syndrome of motor debility composed of the following principal elements: exaggeration of the tendon reflexes, disturbance of the plantar reflex, associated movements, incoördination of voluntary movements, and paratonia. He mentions also many less important accessory signs which we shall refrain from enumerating here. All these anomalies are physiological in young children, and their overprolonged persistence indicates, it can easily be understood, an arrest in the development of the motor areas of the cortex. Some persons who are particularly intelligent sometimes exhibit a definite motor weakness, but this is exceptional, and the motor weakling is usually at the same time an intellectual weakling.

Psychopathic personalities are still to be distinguished; the constitutional delinquent, the hyperemotive and the paranoid present above all, moral, affective, or emotional disturbances. The intelligence, properly speaking, is usually normal. These persons can generally pass their childhood in the common schools, sometimes even attain success. It is generally only in their later childhood or at adolescence that they come in conflict with the law, or that they develop a frank psychosis which leads to their detention in an asylum.

The *dementias* are still met with often enough. Epilepsy in the child often brings on mental degradation quickly; the seizures prevent the subject from prosecuting his studies; changes in disposition and character make him sometimes a candidate for the asylum.

Traumatism and infectious maladies of childhood can also give rise to the various developments of dementia. A little girl, whom we studied, particularly well endowed mentally up to the age of five years, passed through at that time an attack of malignant scarlatina. According to the statement of her relations she had "lost her memory;" as a matter of fact, she was in a characteristic state of dementia, recalling hebephrenia. A special place should be reserved for schizophrenia and dementia præcox, which rarely come on before puberty. The antecedent history of the patient, his lack of interest, his affected indifference, his incoherence, his impulsiveness, his egotism, his catatonic postures, and a host of other symptoms, more or less constant, make this condition easy of recognition.

Certain physical affections of the neuraxon are often the cause of mental abnormalities in children: infantile paralysis, encephalitis lethargica, cerebrospinal meningitis; chorea, disseminated sclerosis, and cerebral tumours are the most frequent; in addition, we should mention the infantile hemiplegias, most often related to heredo-syphilis, and also certain epilepsies, to which Geyelin and Penfield[3] have lately drawn attention, that bring about calcifying endarteri-

tis in the brain. These physical maladies, in general, present no characteristic psychic syndrome, but the history and, above all, the neurological examination, should point the way to diagnosis.

The feeble-minded person is not protected from all these mental and physical disorders; on the contrary, he is, by definition, a being with lessened resistance who bears with difficulty the assaults of community life. Thus it is that we often meet with, on the one hand, the perverse feeble-minded, the epileptic, the hysterical, the hypermotivated, and the paranoiac, or, on the other hand, those who present congenital hemiplegia, infantile paralysis, encephalitis, tuberculosis, rickets, to name only the principal conditions. For example, we have followed for some years at St. Michel Archange the case of a complete imbecile, a heredo-syphilitic and epileptic, and almost blind, who was able to pronounce only a few words, and thus was difficult to understand; he presented also arrest of physical development, infantile hemiplegia, involuntary movements, and gastro-intestinal disturbances. Pulmonary tuberculosis, fortunately put an end to his miserable existence. Patients are not always so seriously affected, and when confronted with the association of physical disabilities and mental debility one should consider the part played by the different syndromes before judging of the educability of the child.

PROGNOSIS

A satisfactory state of the physical health is the principal requisite in undertaking successfully the education of a feeble-minded person. It is, moreover, of the highest importance to follow these children from a tender age, inasmuch as they are then more tractable, more suggestible, and more submissive; accordingly, the possibility of moral contamination is lessened, various other dangers can be avoided, and very serious complications can be rendered more remote. Troubles of conduct, instability of attention, as also of behaviour and character, are of unfavourable prognostic import.

The level of intelligence can be raised when the subject is young and the degree of retardation is slight. All the authors have for a long time been of this opinion, and recently Dr. Lucie Bonisse,[4] a pupil of Dr. Th. Simon, at Paris, has established "curves of intellectual development." Her method, based on numerous and prolonged observations, enables one to predict in a very exact way the development of the child. The mental standard is generally set at ten years, the minimum requirement necessary for life in society. This is one of the principal objectives that we should aim at in the education of the young feeble-minded person. It is usually easy to decide whether this attainment is a possibility, and the absence of physical infirmities or psychopathic associations will permit of a more hopeful outlook.

TREATMENT

Many simple feeble-minded people live peaceably in society; it is essential that their environment should furnish them with surveillance, protection, and necessary guidance.

It is of prime importance to treat first of all the physical state. Hereditary syphilis is more and more common. The Wassermann test, according to the authorities, is positive in only 5 per cent of the cases. We are quite in accord with this opinion. One should remember, however, that a negative Wassermann test does not exclude syphilis; one should therefore hunt carefully for the stigmata of this disease, and institute a prolonged treatment that will be likely to produce beneficial effects on the general health of the child. Anæmia, chlorosis, rachitism, scrofula (for states of excitement and agitation are almost always symptomatic) should receive appropriate treatment. Disorders of the endocrine systems can be the cause of mental retardation, and a treatment that is well carried out and sufficiently prolonged will sometimes produce happy results.

The rules of a school for the mentally deficient ought, without being too rigid, to assure good order and discipline. It it understood that the management of one child may differ greatly from that of another; those who are particularly difficult and obstinate need a stricter régime. Nevertheless, one should always proceed at first with gentleness and reason; the various punishments should be instituted with discernment and given by responsible persons.

The intellectual faculties of our patients are developed by providing them with modified and simplified scholastic courses, graded according to their ability. Various branches of knowledge are taught to the older ones. Singing, music,

elocution, are very valuable aids. Moral education is furnished them by obedience to rule, punctuality, attendance on religious services, and free participation in sport.

The various occupations mentioned complete the instruction and, at the same time, furnish sane amusements under supervision, and hygienic recreations. It is unnecessary to insist upon the importance of the physical and moral relaxation on the children in general; ours demand still more of it. May we add, finally, that politeness, charity, and honesty are cultivated as far as possible by example and encouragement, on the one hand, and by the correction of faults, on the other. Thus, we can train our pupils to meet the day's work and acquire sufficient of the sense of honour and responsibility that they may be able to live in society.

In conclusion, we may state that L'École La Jemmerais, inaugurated in September, 1928, is a provincial bilingual institution, supported by the Government, and dedicated to the needs of the whole province.

We take particular pleasure in thanking our chief, Dr. A. H. Desloges, for his unfailing care, as well as the psychologists and psychiatrists of the province, who have not ceased to give us their friendly co-operation since the opening of our school.

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PSYCHOPATHIC DISORDERS AMONG EX-SERVICE MEN*

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IN presenting this brief summary of psychopathic disorders among ex-service men, the observations are confined to the type of case in the neuropsychiatric service at Ste. Anne's Hospital.

This service was instituted some nine years ago, and, with a psychiatric population averaging more than three hundred, it may serve as representative of the disorder of this nature throughout Canada. Much has been said of the conditions of active warfare, its stresses, shocks, wounds and disease, and one cannot doubt as to their effect on human beings, generally, and that, moreover, these trying conditions were the activating, if not the direct, causes of mental upsets, there is also little doubt.

The great majority of psychiatric patients under our care suffered their original upset while serving with the Canadian Expeditionary Force during or immediately following active service. In a very small percentage there was a history of some similar upset prior to enlistment, with war conditions undoubtedly activating a latent unbalance. A much larger percentage showed no evidence of mental disturbance until after demobilization, when there was a general relaxation; the emotional tensions which had carried many through most trying experiences held throughout the stress, only to break down later. The legislature has been generous with this latter type, in that the Department of Pensions and National Health, under which we at present operate, has accepted responsibility for most of these cases, often with full compensation for both the patient and his dependents. For instance, a man who had had a reasonable length of service in France, and who suffered a so-called shell shock, neurasthenia, a psychotic episode or similar upset, which condition subsequently cleared up, but which years after demobilization recurred through causes other than vice or misconduct, would even at this late date be entitled to hospitalization for observation and investigation, and if such investigation excluded vice, misconduct and venereal disease as exciting factors in the recurrence of his unbalance, he would be eligible for treatment to a finality, with a living allowance for his dependents and a small monthly allowance for himself, so long as hospital treatment was necessary. If recovery is complete he is returned to civil life, but if there still

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remains an industrial handicap his case is then considered for compensation by the Board of Pension Commissioners.

A good portion of enlisted men were subjected to abnormal stresses prior to or just before entering manhood, and now, ten years later, are typically of præcox type, though at the time of the original disorder they were classed variously as shell shock, neurasthenia, confusional insanity, environmental psychotic episode, etc. Glancing over our clinical records, it is found that dementia præcox constitutes more than two-thirds of our neuro-psychiatric strength. Many of these were doubtless constitutionally predisposed, but others have, after careful investigation, shown no trace of such predisposition. With the comparatively early enlistment age, it was inevitable that there should be a large percentage of this type of psychosis, the normal number being probably augmented by the subjecting of immature emotional balance to abnormal stresses. The remaining one-third is composed of psychoses and neuroses in about the same percentages as are found in civilian institutions. Manic depressive insanity, toxic psychoses, primary mental defect, psychotic episodes occurring on a deficiency basis, epilepsy (traumatic and idiopathic,) cerebro-spinal disease, alcoholism, drug addiction, and a small number of cases grouped under the psycho-neuroses are found.

The re-establishment of the defective group, particularly those with recurring psychotic episodes has been found difficult of solution. The chief difficulty is not because of the mental level but rather the lack of social adjustment. Many of this group would probably be self-supporting to-day were it not for this lack of adjustment. If those of minor intellectual equipment are allowed a life undisturbed, a mechanical routine existence, the likelihood is that they may continue so indefinitely. Take the same potentially unstable individual from this routine and he will usually find difficulty in resuming his normal life; put him in uniform for three or four years, with, perhaps, front line experiences, and his readjustment to his former station becomes increasingly difficult, and in some few cases impossible.

Military service carried with it an existence more or less care-free, and with but little personal responsibility. So long as the man remained in uniform he was assured of a living and provision for his family. The man became dependent. Intensifying this dependence some men have greater obligations than formerly, with growing families, and find themselves unable to cope with the added responsibilities. In some few cases a socialistic attitude has become prominent, some men, fortunately few in number, trying to capitalize their military service, assuming the viewpoint that "we sacrificed our positions, risked our lives, and injured our health for the country, and now the country should look after us." Thus the compensation handicap to recovery in these few cases presents a problem in itself. By far the larger number, however, have risen superior to their disabilities, as a result of natural adaptability, special trainiing, experience, business relations, etc.

Contrary to general belief we find less than 4 per cent of our cases classed as cerebro-spinal disease, the impression of the laity being that a much larger number of our patients suffer from this type of disorder. Treatment of these cases with malarial inoculation and tryparsamide has shown satisfactory results. Of the 10 cases so treated, 2 have recovered and resumed their places in society; 6 have definitely improved; 1 has retrogressed; and 1 advanced case died before the onset of rigors.

The hospital is adequately equipped with up-to-date apparatus. Fourteen continuous baths are found on our wards, and a physiotherapy section, with complete hydropathic system and electrical appliances, including galvanism, faradism, diathermy, and the sun-lamp. Our x-ray department has recently been renovated and obsolete equipment replaced by modern. Operating theatres for general and special work, a clinical laboratory, and a dental clinic are provided.

Coming to our staff, there are three resident full-time physicians in charge of the neuro-psychiatric patients, also a resident chest specialist whose services are always available, and a dental surgeon who makes periodical surveys of all cases. The consulting staff is composed of outstanding specialists; two alienists, a neurologist, pathologist, an eye, ear, nose and throat specialist, and a Roentgenologist make regular and frequent visits, their advice and recommendations for treatment, and disposal being of inestimable value. In addition, the services of physicians in other special branches is available; in all our consulting staff comprises thirteen specialists.

Female graduate nurses, all with psychiatric training, are in charge of our wards, irrespective of the type or severity of the patients' disorders,

and to these nurses the mental attendants are directly responsible for the actual care of the patients and the supervision of the ward. These attendants are all ex-service men, and, having experienced war conditions like their less fortunate charges, are better able to understand the whims and eccentricities originally born of military affairs. The "brothers-in-arms" sentiments exist and there is a sympathetic relationship between patients and staff to perhaps an unusual degree. Many of these patients have retained a portion of their military discipline, and the modified use of this facilitates the handling of large groups. There is no intimation of resentment in the use of these measures, and provided the discipline is not too rigid the benefits more than offset the disadvantages.

Ward occupational therapy is carried on extensively under the direction of six specially trained ward aides, and through a generous and sympathetic public most completed articles find a ready market. The use of occupational therapy has done much to restore, or at least retain, faculties which would otherwise degenerate.

A social service department is maintained to investigate cases influenced by difficult domestic complications, and also to secure follow-up reports of patients discharged. In addition, the department has established and has in successful operation Vetcraft Shops in different centres of the Dominion, where employment is provided for those industrially handicapped either physically or mentally, where a living wage is provided, and where eccentricities are tolerated to the last extreme. It is interesting to note that these shops, now operating on a wholesale production basis, are practically self-supporting. Outdoor occupation provides a means of employment during favourable weather for about 35 per cent of the patients, and the improved appearance of our grounds during the past few years serves as a stimulus to further effort in this direction. We started with a very barren piece of land and now have attractive grounds with still room for much improvement and unlimited occupation for our patients. They take a genuine interest in the general appearances of their surroundings, and are undoubtedly benefited thereby. Other features of our establishment which cannot be overlooked are the green house and gardens furnishing healthful and interesting occupation for about forty patients, and from which incidentally flowers and ferns for the wards are supplied throughout the year.

In concluding, a general survey of our cases suggests that the psychopathic disorders among ex-service men show but little deviation in type from the psychopathies ordinarily encountered among civilian population. The delusions and hallucinations of the acutely psychotic types appear in some cases to be punctuated with disturbances referable to war experiences, but, generally speaking, one is impressed with the similarity of the disorders and how nearly the percentages of each group conforms with the records of psychopathic hospitals other than those for ex-soldiers.

The Federal government has been justly generous with the returned man, by providing practically unlimited facilities for the treatment of those physically and mentally afflicted. From a total enlisted strength of some half million men, there are at present just over one thousand psychopathic cases receiving hospital treatment, a comparatively small percentage, and Canada may well congratulate herself on this evidence of the stability of her manhood.

HALF-MINUTE THEMOMETRY.—"Although thermometers are stamped by the National Physical Laboratory, Kew, as a guarantee of the accuracy of their reading, I have frequently found that a true reading is only obtained after five or ten minutes, when the instrument is stamped as a 'half-minute.' This seems to apply to the very subnormal temperatures, and not to any extent to those above 98.4° F. Seeing that temperatures of 95.6° to 96.6° F. are very much more common than is generally supposed, the matter seems to be of considerable clinical importance. Can you tell me the reason for this peculiarity? My own temperature frequently runs at a very subnormal level, so I have been able to test the accuracy of my statements on many occasions with many different thermometers, and controls have been made on numerous patients."

The Kew Certificate is no longer compulsory, but even a perfect "half-minute" thermometer can only give a correct reading in a cavity whose temperature is constant, such as the rectum. The temperature of the mouth, even in the alcove beneath the tongue is affected by the currents of air which have recently passed through the mouth of the patient. This effect is so pronounced that a mouth reading, except in cases of fever, requires at least a minute, and often three minutes or more, to reach its proper level. Anyone can ascertain this for himself who will take the trouble of watching the mercury rise after the thermometer has been placed in the patient's mouth. When the surrounding atmosphere is cold the correct mouth reading is still more delayed, and in alpine sanatoriums where mouth temperatures are taken it is often the rule for the thermometer to remain *in situ* for ten minutes, whatever may be the length of time that the thermometer itself takes to register. On the other hand, a "three-minute" thermometer will give a correct reading in half a minute in the rectum, or in still shorter time in the stream of urine. Briefly a "half-minute" thermometer requires a "half-minute" medium.—Dr. H. W. Hales, *The Lancet* **1**: 438, 1930.

THE INHALATION OF PURE OXYGEN IN THE TREATMENT OF DISEASE*

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THE therapeutic value of inhaling pure oxygen for long periods of time has not heretofore been investigated. Considerable research has been done on therapy with 40 to 60 per cent oxygen, but the realm of 60 to 100 per cent has been avoided because of the fear of producing harmful results. Medicinal and commercial oxygen is about 99.5 per cent pure. This is what is meant when the terms "pure" or "100 per cent oxygen" are used.

The purpose of this paper is an endeavour to establish: First: that pure oxygen can safely be administered by means of the face mask or nasal inhaler to cyanotic patients continually, for as many days as the cyanosis persists. Secondly: the advisability of administering 100 per cent oxygen early in pneumonia, as soon as the diagnosis is made, and continuing it throughout the course of the disease, intermittently if there is no cyanosis, and continually if there is. Thirdly: that daily inhalations of pure oxygen for from one to several hours are beneficial in a number of pathological conditions where there is no apparent lack of oxygen in the blood.

ANOXÆMIA

The word "anoxæmia" literally means "blood without oxygen," but is used to indicate any decrease in the normal amount of oxygen in the blood. Anoxæmia occurs in a variety of diseases and conditions, among which are pneumonia, cardiac decompensation, asthma, bronchitis, pulmonary embolism, meningitis, carbon monoxide poisoning, drowning, overdose of morphine or anæsthetic agents, laryngeal and tracheal obstruction.

The evil effects of anoxæmia, especially upon the cardio-vascular and central nervous systems, are so well known that they do not need to be enumerated here.

When there is a lack of oxygen in the blood and tissues the logical treatment is to increase the oxygen in the inhaled air to such a degree as to restore the oxygen in the blood to normal. The older methods, namely, the tube and funnel, and the nasal catheter methods have proved to be practically worthless from the standpoint of beneficial results, as the oxygen percentage in the inhaled air is raised but a few points. The newer methods, which include the oxygen chambers and bed-tents, constructed for the purpose of administering 40 to 60 per cent oxygen, have been a great advance in oxygen therapy. Yet, if normal blood oxygen is the object to be attained when treating anoxæmia patients even these methods fail in a certain percentage of cases. In those reported by Barach and Woodwell,[1] in 1921, the administration of 40 to 60 per cent oxygen failed to normally oxygenate the blood in 50 per cent of the pneumonia patients treated. Stadie,[2] in 1922, in reporting on the results of treating pneumonia patients in an oxygen chamber said "In some instances, despite the administration of 50 to 60 per cent oxygen, the arterial unsaturation remained high." In other words, there were some that suffered from a severe anoxæmia even while inhaling 50 to 60 per cent oxygen. In the group of pneumonia patients reported by Barach,[3] in 1926, the administration of 40 to 60 per cent oxygen brought the blood oxygen up to normal in only 15 per cent.

A careful consideration of these facts would naturally lead one to believe that there must be something wrong with a method of oxygenation that does not normally oxygenate the blood, especially in view of the universally admitted disastrous effects of anoxæmia. If it were a case of prescribing a cathartic and a moderate dose proved ineffectual, the logical procedure would be to increase the dosage sufficiently to obtain the desired results. This logic would have been applied to oxygen therapy had it not been for deductions drawn from experiments upon normal animals. It was

* Paper read at the meeting of the Ontario Medical Association, Hamilton, May 31, 1929.

found that if rats, guinea pigs, and rabbits were kept in an atmosphere of 70 to 100 per cent oxygen they developed in from three to fifteen days a fatal pneumonia, characterized by widespread pulmonary œdema. It was concluded that if the normal animal, whose blood was not in need of more oxygen, could not tolerate these high percentages, neither could an individual whose blood was greatly below the normal in its oxygen content.

It is not always logical to draw conclusions from the normal and apply them to the abnormal, as a little reflection will show. For example, a dose of morphine large enough to prove fatal to a normal individual can often be safely administered to one suffering severe pain. What is fatal in the one case is beneficial and possibly a life saver in the other. There is a difference as to tolerance between the normal and the abnormal. Again, if a patient is in a state of shock from hæmorrhage or other cause, it may be possible to administer several quarts of normal salt solution intravenously with only beneficial results. The same quantity given to a normal individual might be a serious matter. Again, if the salt solution is given to the dehydrated patient subcutaneously it will be rapidly absorbed, while in the normal individual it will not be readily absorbed but will remain for a long time in the subcutaneous tissues, acting as an irritant. Apparently the same is true in the administration of pure oxygen; if the blood is in need of more oxygen it is rapidly absorbed and does not act as an irritant. The recent experiments of Dr. Sayers[4] should do much toward overcoming the fear of administering the higher percentages of oxygen. He says: "We have exposed various animals (rabbits, guinea pigs, and white rats), to practically 100 per cent oxygen for various periods of time. The purity of the oxygen was from 98.5 to 99.6 per cent. We exposed a group of animals for sixteen hours per day to the above concentration for fifty consecutive days without apparently harmful effects." If the normal animal can safely inhale pure oxygen for sixteen hours a day, may it not be possible that an animal whose blood stream is deficient in oxygen can do so for 24 hours?

The writer has administered pure oxygen by means of the face mask and nasal inhaler to more than 100 cyanotic patients, for periods varying from one to twenty-seven days, the administration being as nearly continuous as possible. The average length of time in these cases for continuous administration was about seven days. There is no doubt that at times oxygen was diluted with air, as it is difficult to keep the mask closely approximated to the face over a period of days. Also, when the nasal inhaler is used the oxygen will be diluted if the patient breathes through the mouth. It is possible that pure oxygen was actually delivered to the lungs for no longer than sixteen hours a day, which Dr. Sayers has found is safe for normal animals. It may have been even less than sixteen hours a day. However, the attempt was made to administer pure oxygen continuously to these patients. If they were mouth breathers the face mask was used. The advantage of the nasal inhaler is that patients can take nourishment or expectorate without interrupting the administration of oxygen. Determinations show that when the mask is held snugly the oxygen content is about 98.8 per cent.

It has been an interesting observation, inasmuch as pure oxygen caused pulmonary œdema in animals after several days exposure, that many patients suffering from pulmonary œdema were greatly benefited by inhaling pure oxygen, the œdema quickly disappearing in some of the cases. In none of the cases was the condition made worse. Also, cases of acute and chronic bronchitis have been greatly benefited by inhaling pure oxygen, whereas, if oxygen were an irritant, the reverse should have been true. One patient whose bronchial mucous membrane was severely burned by inhaling at the time of an explosion was greatly soothed by the inhalation of pure oxygen, which was kept up intermittently for several days. This patient recovered without the development of any pulmonary complications.

The higher concentrations of oxygen are apparently more productive of the desired results than are the lower. Benedict and Higgins[5] "found no material change in the pulse rate of normal individuals when the oxygen inhaled was raised to 40 per cent. A slight though noticeable slowing occurred when 60 per cent oxygen was breathed, and a very positive slowing when 90 per cent was administered." In some of the pneumonia cases

the reduction in the pulse rate has been marked, in others there was only a slight reduction, and in a few cases very little if any effect was observed, these being the extremely toxic type.

No comparative study has been made as to the effect of the various percentages of oxygen on the respiratory rate, but in the normal individual the rate is often reduced to four and six per minute during the administration of pure oxygen. It is reasonable to assume that in those cases where 40 to 60 per cent oxygen does not entirely relieve the anoxæmia 100 per cent oxygen would be more effectual in reducing the respiratory rate. Obviously pure oxygen is more potent in relieving severe anoxæmia than 40 to 60 per cent oxygen. No blood oxygen determinations have been made in these cases, but in a few of the extremely toxic type and in those with a beginning circulatory failure, the administration of even pure oxygen apparently failed to bring the blood oxygen up to normal, as a slight cyanosis still persisted. In other cases the cyanosis was slow in disappearing. The speed with which a pink colour was restored to the finger nails seemed to have been of prognostic value.

PNEUMONIA

In the majority of the pneumonia cases the administration of pure oxygen markedly stimulated elimination by the skin. Many of the patients continued to sweat profusely as long as the oxygen was administered.

According to Martin Fisher[6] pure oxygen apparently promotes greater elimination through the kidneys than 40 to 60 per cent oxygen. He states: "The normal urinary secretion is absolutely dependent upon an adequate oxygen supply to the cells constituting the parenchyma of the kidney. Any interference with this oxygen supply leads to a decrease in urinary secretion, even to the point of absolute and permanent stoppage. Through a particularly favourable oxygen supply to the kidneys the secretion of urine may be increased above that ordinarily considered normal."

There were 143 pneumonia patients to whom 100 per cent oxygen was administered. Of these there were 74 recoveries and 69 deaths, making the death rate 48.2 per cent. This, you will say, is not a record to be proud of, although it compares favourably with some groups of cases that have been reported. In the usual report on the death rate in pneumonia both mild and severe cases are included. The usual tabulation is not a collection of the especially desperate cases. If it were, the death rate would be much greater. The 143 cases reported by the writer are a collection of referred cases in which, in the opinion of the family physician, the prospects for recovery were either very doubtful or entirely nil. There were only a few exceptions, in which oxygen therapy was instituted before the outlook for recovery seemed unfavourable.

Even in those cases in which the oxygen administration was begun the first day of the disease, the patient's condition was usually alarming, either because of cyanosis, circulatory failure, or the presence of grave disease, such as nephritis, asthma, hypertension, or myocarditis. The old rule was usually followed, of waiting until it was apparent that the patient would probably die, before calling for oxygen therapy. There were several cases where the patient did not live long enough to permit oxygen administration to be even started. Thirty-three of the 143 patients lived less than 24 hours after oxygen administration was begun, the average length of time being 10 hours. If we deduct these 33, we have in the remaining 110 cases, 74 recoveries, and 36 deaths, making the death rate 32.7 per cent. There were 13 among these remaining 36 deaths who lived less than 48 hours after oxygen administration was begun, which indicates the seriousness of their condition at the time oxygen therapy was begun. There were others that had such serious complications as meningitis, asthma, nephritis, generalized streptococcic infection, diabetes, pancreatitis, and cardiac diseases, including one with aortic regurgitation.

There were 46 cases following an attack of influenza, of which 23 recovered and 23 died, making a death rate in this group of 50 per cent. There were 34 cases of lobar pneumonia, of which 28 recovered and 6 died, making a death rate of 17.7 per cent. There were 15 cases of broncho-pneumonia, of which 10 recovered and 5 died, making a death rate of 33.3 per cent. There were 16 post-operative cases, of which 13 recovered and 3 died, the death rate being 18.7 per cent.

RECOVERIES AND DEATHS IN RELATION TO TIME OF STARTING OXYGEN THERAPY

	Cases	*Recoveries*	*Deaths*
The 46 cases of the influenza group were as follows:			
1st day.....	6	6	0
2nd day.....	9	4	5
3rd day.....	7	4	3
4th day.....	7	2	5
5th day or after	17	7	10
The 34 of the lobar type as follows:			
1st day.....	5	4	1
2nd day.....	5	4	1
3rd day.....	5	4	1
4th day.....	5	3	2
5th day or after	14	13	1
The 15 in the bronchial group:			
1st day.....	3	3	0
2nd day.....	1	1	0
3rd day.....	1	1	0
4th day.....	3	3	0
5th day or after	7	2	5
The 16 in the post-operative group:			
1st day.....	10	10	0
2nd day.....	0	0	0
3rd day.....	4	3	1
4th day.....	0	0	0
5th day.....	2	1	1

There were 24 cases where oxygen therapy was begun on the first day, among which there were 23 recoveries and one death. Fifteen of these were medical and 10 post-operative. The one death was a medical case, with lobar pneumonia. The man was 63 years of age, with a blood pressure of 160/80. On the 7th day he had a cerebral hæmorrhage, after his temperature and pulse rate had been normal for 24 hours. This cannot really be classified as a pneumonia death, as his pneumonia infection had subsided.

There were 6 of the cases, 4 post-operative and 2 medical, in which the pneumonia seemed to have been aborted by the early administration of oxygen. They ran a short course of from 12 to 24 hours, and the question would naturally arise, whether or not they really had pneumonia. At least, they had the classical symptoms, with rusty sputum in four of the cases.

The gratifying results shown in those cases where the oxygen administration was started on the first day of the pneumonia deserve consideration, especially in view of the fact that the patients were nearly all seriously ill. The old custom has been to administer oxygen in low concentrations late in the disease, whereas the converse should be the case, namely, to administer oxygen in high concentrations early in the disease. The treatment in these cases was to administer pure oxygen continuously for the first twelve hours whether cyanosis were present or not. Afterwards, if there was none, the oxygen was administered for from 20 to 30 minutes each hour if the patient was not asleep. If cyanosis was present the administration was continuous.

The writer is not advocating that oxygen should be the only treatment in pneumonia, but believes that, inasmuch as its early administration helps to support the heart, a reduction in the doses of the customary supportive medication is made possible. The intravenous administration of glucose in the toxic cases, he believes, has helped in the saving of some of these cases. In one case, with marked abdominal distension, the irrigation of the colon for an hour every four hours for two days was of great benefit and apparently a deciding factor in his recovery.

For a physician to recommend oxygen therapy on the first day he makes a diagnosis of pneumonia requires courage, inasmuch as the laity are accustomed to think of oxygen administration as synonymous with approaching death. However, when the physician explains that he is using it early in order to prevent possible trouble later on, he can usually win his point.

OXYGEN IN OTHER DISEASES

Cardiac decompensation. — Several cases of cardiac decompensation associated with cyanosis, orthopnœa, nephritis and œdema have been treated with markedly beneficial results. An old damaged heart cannot be fully repaired, but oxygen has helped in restoring a few of the cases to such a degree that they were able to return to limited work, when at the beginning of oxygen administration recovery seemed hopeless. One striking feature in the cases associated with œdema of the lower extremities has been the rapidity with which the œdema disappeared. There was only one case that failed to respond. In some a marked œdema would disappear in a few days time, while in others it required a month or more.

Asthma.—In the treatment of asthma oxygen has been of marked benefit in the majority of cases. The administration of oxygen in this

disease is logical if we agree with Haseltine and others that it is primarily a toxicosis. It is probable that the increase in the blood oxygen helps in oxidizing the toxins and in restoring the nasal mucous membranes to normal. There were a few cases in which oxygen was of little if any benefit.

Hay Fever.—The percentage of good results in cases of hay fever has been about the same as in asthma. The results in one case of twenty-three years' duration was spectacular, as the symptoms disappeared after three treatments and did not reappear the following two years, although no more oxygen was administered.

Influenza.—There were several cases of influenza to which pure oxygen was administered for two hours daily, beginning on the first day of the disease. The results have been gratifying, as in none did pneumonia develop and there was no post-influenzal malaise. Usually there was a drop of from one to three degrees in temperature following the first hour of oxygen therapy. There were three cases in which oxygen administration was begun on the third day when the chest signs made one suspicious of an early pneumonia. The oxygen apparently cleared these up.

Extensive burns.—There were two cases of extensive burns treated with undoubted benefit. One was too desperately ill to permit of skin grafting. The burned area, which covered more than half the body, entirely healed with oxygen administration for two or three hours a day over a period of 6 months. Whenever the oxygen was discontinued the growth of new skin ceased.

Post-operative.—Two cases of post-operative pulmonary emboli were treated with marked benefit, both patients recovering. One case of massive collapse of lung was given pure oxygen continuously for seven days with recovery. It has proved beneficial in cases of hæmorrhage and shock, and for hyperthyroid cases, both pre-operatively and post-operatively. One pre-operative case has so far escaped operation, as his condition is nearly normal, with a minus 6 metabolic rate.

Oxygen Administration

The administration of oxygen in order to be successful, especially in the serious cases when it is given continuously, should be in charge of one familiar with the physiology and pathology of respiration and accustomed to the handling and administration of compressed gases and the use of apparatus. The anæsthetist, by virtue of his experience, is already in possession of the main requirements for the application of oxygen therapy.

Conclusions

1. The continuous administration of pure oxygen, by means of the face mask or nasal inhaler over a period of days, to anoxæmic patients has been productive of only beneficial results.

2. The early administration of pure oxygen in pneumonia is a potent factor in reducing the mortality rate.

3. The administration of pure oxygen for from one to several hours daily has proved beneficial in cases of cardiac decompensation, asthma, hay fever, influenza, extensive burns, pulmonary embolism and hyperthyroidism.

In closing I wish to thank the Linde Air Products Company, who generously furnished oxygen gratuitously to many of these cases; the Toledo Technical Appliance Company, for its co-operation in developing a satisfactory oxygen apparatus; Dr. Fred. R. Griffin for determination of the oxygen percentages; the State Institute for the Study of Maligant Diseases; the physicians who furnished cases; Dr. George M. Shearer, and my present associate, Dr. C. J. Durshordwe, for their untiring efforts in applying oxygen therapy.

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THE HEART AND THE GENERAL PRACTITIONER*

BY GEO. C. HALE, M.D., C.M.,

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THE average practitioner is very frequently called upon to examine a patient's heart for evidence of so-called heart disease, and the frequency of this occurrence may be explained by reasons other than the incidence of organic affections of the heart. The heart, like the stomach, is frequently a barometer of the condition of the patient's general health, including his nervous system. Pulmonary tuberculosis, chronic focal infections, mental overstrain, worry, etc., will frequently cause what one may term dyspepsia and cardiac palpitation. The average patient, however, will take dyspepsia in a more or less philosophical manner, but any suggestion of cardiac disease looms large in his imagination and will bring him hurrying for advice.

Now the diagnosis between a functional and an organic cardiac condition is not always simple, and the result is, at times, a tendency on the part of the doctor to "play safe", feeling that, between two evils, that of warning the patient of impending trouble is less than telling him that all is well with the heart, risking the possibility of a future breakdown as a result. As a matter of fact, the first procedure may be just as disastrous. Intractable cardiac neurasthenia is often the result of such an act on the part of the over careful physician, with the development of a disability which will perhaps cripple the patient as much as, or more, than a mild organic cardiac affection.

Cases will naturally be encountered where the diagnosis is so difficult that the services of an experienced cardiologist are desirable, together with the laboratory aids of x-ray and electrocardiograph, which he has at his disposal. As these are neither feasible nor necessary in the case of every patient presenting heart symptoms, the problem before us is the formation of a set of rules for simple office examination which, when followed, will afford the minimum number of disasters.

First of all, let us remember that proper function of the heart depends largely on three factors. (1) A strong and healthy muscle; (2) proper action of the valves; (3) correct timing and propagation of the wave of contraction. That is, as in an automobile engine, there must be good explosion (for muscle contraction is a physiological explosion), well seated valves, and correct timing, a defect in any one of which is followed by lack of power. Now, although in the heart a defect in one of these three factors may cause discomfort and disability on the part of the patient, they are not of equal importance in the prognosis or treatment of the case.

Let us consider the third factor first—the question of timing, or *cardiac irregularities.* Without going too deeply into the anatomy and physiology of the heart we must remember that contraction begins at a point at the base of the heart, (sino-auricular node) between the right auricular appendix and the superior vena cava, passes over the auricles to the Bundle of His, and is transmitted by the latter to the ventricles. Changes in rhythm, then, may be due to unbalanced nerve control in the starting of the beat, not organic in origin, as seen in the normal sinus arrhythmia in children, or an adult heart which is more rapid or slower than is usually found; or the irregularity may be due to blocking of some of the impulses at the Bundle of His, which usually means organic disease, or to the occurrence of abnormally irritable areas in the auricles which cause abortive waves of contraction starting at many different points, resulting in the irregular irregularity of auricular fibrillation, which is, as you know, a very grave sign and occurs in about three out of every four cases of serious cardiac failure.

Some of the irregularities can only be properly diagnosed by the polygraph or electrocardiograph, but the more common ones can be easily recognized by ordinary examination. There are

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two common types in young people which are not evidence of organic disease and yet which condemn thousands every year to an invalid existence by being mistaken by the physician for auricular fibrillation.

Sinus arrhythmia.—This is merely an exaggeration of the physiological rule that the heart rate accelerates during inspiration and slows during expiration. It is very common in children and young adults especially following an illness. The pulse rate is continually changing but the beats are of equal force, and careful observation reveals the fact that the changes in rhythm depend on the respiratory phases. Also with exercise or excitement the pulse becomes more regular. This type of irregularity does not indicate organic cardiac disease; in fact, Mackenzie states that its presence, following an infection, shows that the heart has escaped damage, provided that the rate is below 70 beats per minute.

Extra systole.—In taking the pulse this appears to be a dropped beat and the patient is frequently conscious of it. Examination of the heart or a pulse tracing shows that it consists of an extra systole followed by a pause. Extra systoles undoubtedly occur in diseased hearts, in which case they are accompanied by other evidence of organic cardiac disease. For this reason, if the extra systoles are so frequent as to cause coupled beats or to produce a disorderly action of the heart, it would be as well to procure further evidence before making a decision. But extra systoles alone, in moderate number, unaccompanied by other evidence of a diseased heart, and disappearing with exercise or excitement may be disregarded. Mackenzie has followed so many patients with this single symptom for more than twenty-five years, without further evidence developing of organic cardiac disease, that he regards it as of no prognostic importance.

Just a word regarding the very slow and the very fast heart. There is, on the one hand, physiological bradycardia, of no importance, and on the other, the bradycardia of disease of the Bundle of His. There is again, on the one hand, paroxysmal tachycardia, of no importance in itself, and, on the other, auricular flutter, indicating organic disease. These cases are comparatively rare and deserve careful observation and graphic records before pronouncing judgment.

Finally there is auricular fibrillation, described as the disorderly heart or delirium cordis. This type of irregular irregularity is readily recognized and is of grave prognostic significance.

Integrity of the valves.—Let us first fix two ideas in our minds. (1) A murmur does not necessarily indicate valvular disease. (2) A valve defect *per se* is not always of serious import, even though it indicates true organic disease of the endocardium. Let me explain my meaning more fully. Lacking evidence of cardiac enlargement or other signs of organic cardiac disease, a systolic murmur may be absolutely disregarded. A diastolic murmur, however, always indicates organic disease and is of more serious importance. It may be the diastolic or presystolic murmur of mitral stenosis, which, in the vast preponderance of cases, is associated with disease of the myocardium, is progressive, and always suggests a grave prognosis; or it may, especially in older individuals, mean sclerosis of the aortic valve ring with consequent interference with the circulation through the coronary arteries leading to myocarditis. But in either case you will see that the presence of a diastolic murmur means the probability of myocardial disease, which, in the last analysis, is the all-important factor.

With regard to mitral stenosis remember that in early cases the typical presystolic or diastolic murmur may be absent, but in many of these it may be brought out by exertion or by placing the patient on the left side. Even in its absence an accentuated or snapping first sound associated with a reduplicated second sound heard to the left of the sternum—the so-called "postman's knock"—is usually sufficient for correct diagnosis. The presystolic murmur is caused by contraction of the auricle, and in a typical case is immediately followed by the snapping first sound produced by contraction of the ventricle. If, however, there is some degree of heart block with delayed conduction time, as is common in mitral stenosis, the delay between the murmur and the first sound gives the impression that the former has moved back, as it were, in the cardiac cycle and its time appears to be diastolic. The murmur tends to disappear with the onset of auricular fibrillation.

This brings us, then, to the consideration of the first factor on our list, *i.e., integrity of the heart muscle.*. How can we diagnose this condition in the absence of any of the signs already noted? (1) Enlargement of the heart always means organic disease of the cardio-vascular system. (2) Response to effort. Remember that it is the abnormal facility with which symptoms are produced rather than the symptoms themselves that is important. For example, any one of us here who ran five blocks for a street car might give a very good representation of heart failure, and still be suffering from nothing worse than the result of a sedentary and careless mode of living.

In testing for response to effort, temper the wind to the shorn lamb. Do not tie yourselves to a table of so many "foot-minute-poundals," as we are so prone to do in these days of instruments of precision. Depending on the apparent severity of the case, the patient may be put through such exercise as sitting up in bed so many times, hopping ten times on one foot and then on the other, walking rapidly upstairs, doing the pump, using dumb-bells, etc. The increase in the pulse rate, its rhythm, and the time elapsing before it returns to its original rate will, in conjunction with the other signs, be of considerable aid in the estimation of cardiac efficiency.

A word of warning must be interjected here with regard to the diagnosis between the poor response to effort in myocardial disease, and the so-called "effort syndrome" of neuro-circulatory asthenia, as for example, the soldier's heart. In the latter, although there may be dyspnœa on exertion, syncope, cardiac pain, and tachycardia, evidence of gross structural change is invariably absent and the psychical phase of the patient will aid in diagnosis. Time does not permit one to enlarge on this type of effort syndrome, but if the rules already laid down are followed the errors in diagnosis may be reduced to a minimum.

Other evidence of myocardial failure are dyspnœa, cyanosis, engorgement of the veins of the neck, enlarged and tender liver, hypostatic congestion of the lungs, fluid in the abdomen, and swelling of the feet in more or less degree, depending on the severity of the case, taking for granted, of course, the absence of such causal factors as nephritis, cirrhosis of the liver, etc.

A word or two regarding pain. Pain is common in functional heart disease. If, however, a male adult gives a typical description of pain over the heart referred to the abdomen or to the shoulder girdle and arm, which is agonizing in character, and followed by increase in the flow of saliva and urine, and with apparent good health and freedom of cardiac symptoms between attacks, make a diagnosis of true angina pectoris, even in the absenec of all other signs of structural heart disease.

Do not forget the importance in all cases of a history of acute rheumatic fever, a positive Wassermann test, a high blood pressure, and urine of low, fixed specific gravity, especially when associated with the presence of albumin. Any of these findings should suggest a guarded diagnosis even in the absence of definite evidence of true heart disease.

Probably one of the most insidious types of organic cardiac disease is the subacute bacterial endocarditis, as here the symptoms are rarely connected with the heart. A history of chills and general malaise, which may continue over a period of many months with intervals of relatively good health, may be the only indications of disease. Physical examination at first may reveal nothing more than a systolic mitral murmur, but a blood culture would probably be positive. There is usually a history of acute rheumatic fever or a pre-existing endocarditis. As the disease progresses, the fingers tend to become clubbed, the spleen enlarged, petechiæ make their appearance, and evidence of embolism of the internal organs manifests itself by hæmaturia, pain over the spleen, or even hemiplegia. It is frequently diagnosed as typhoid fever, tuberculosis of the kidney, meningitis, etc., as a result of the lack of symptoms or signs referable to the heart.

To sum up: If we were given a group of patients with suspected cardiac disease, the best procedure to follow, in order to separate the sheep from the goats, would be to place in the list of suspect or proved cases of organic cardiac disease those with:

1. A history of acute rheumatic fever, or a history of any severe infection definitely antedating the appearance of the cardiac symptoms.
2. A diastolic murmur.
3. Enlargement of the heart.

4. Evidence of hyperthyroidism.
5. Pain of anginal distribution.
6. A pulse of irregular irregularity with the rhythm not improved by exercise.
7. An abnormally rapid or slow pulse.
8. Evidence of venous congestion.
9. A positive Wassermann test, high blood pressure, or urine of low and fixed specific gravity.

Your final conclusions in this group will be based on a balancing of all symptoms and signs under the methods previously described. The other group may be given a clean bill of health as regards organic cardiac disease.

DAMAGE CAUSED TO THE EYE BY STRONG LIGHT

BY GEORGE H. MATHEWSON, M.D.,

Montreal

DURING the past few years I have had the opportunity to see a number of cases where the eye has been damaged by strong light, and have been struck by the similarity of the eye lesions produced by the different agents. The light was of several different kinds: sunlight, the light reflected from snow, electric light flash, charcoal flash (*i.e.*, the light produced when the charcoal and gases in a retort takes fire, which happens in the manufacture of wood spirit when the retort is opened, the charcoal blazing fiercely the moment the air reaches it), and, finally, acetylene gaslight. The structures affected were the skin of the eyeballs, the conjunctiva, the cornea and the retina, but I never saw all these parts affected in the same individual.

Perhaps the more interesting way will be to take up the lesions according to the nature of the light.

Snow blindness.—I have seen three typical cases of snow blindness in Montreal, and all were observed late in the spring when there was the combination of strong sunlight with a fresh fall of snow to give a bright reflecting surface. Two occurred in men who spent the whole day walking along the railroad track in the country, while the third worked out of doors in an open space. All three were born in Europe and had been but a short time in Canada. The lesions in all were the same: superficial burning of the skin of the lids and face, and conjunctiva with long shallow ulcers of the cornea. The retinæ were not damaged. The corneal lesion was oval in shape, narrow, and very shallow, with sharp edges, the long axis of the oval being horizontal, and it lay below the centre of the cornea. In fact, the ulcer was in that part of the cornea which was exposed to the light, through the narrow slit made by the partly-closed eyelids. It looked like the lesion that would result when a vesicle of the corneal epithelium had been produced and had ruptured anteriorly, leaving a shallow ulcer with the substantia propria as its base. I have seen such vesicles and later ulcers where the cornea has been burnt slightly by hot curling tongs, and, as will be seen presently, in one case of electric light burn. If further evidence is necessary that we have vesiculation of the corneal epithelium it is to be remembered how common it is that the skin of the body is raised in blisters by sunlight. Many writers describe snow blindness as being conjunctivitis, but as you all know a simple conjunctivitis, no matter how acute, does not cause any severe pain, but rather burning and irritation, with a scratchy feeling, as if dirt were in the eye. Of course, there is conjunctivitis, but if there is severe pain the cornea must also be involved.

These cases of snow blindness all recovered in a few days, with the use of simple vaseline in the eyes and protection from the light.

Electric light burn of the conjunctiva and cornea is quite frequently seen at our clinic, and is the result of exposure to the flash from high voltage wires. Some showed conjunctivitis, with slight burn of the cornea, while others showed superficial ulcers, exactly like those seen in snow blindness. One case that I saw last year had definite vesicles of the corneal epithelium (several in each eye) when seen eighteen hours after exposure to the flash. These cases cleared up promptly and perfectly with the application of vaseline and protection from light. The lesions are very painful.

The only case of *charcoal flash,* if I may call it so, had been under treatment by a local physician for some days before I saw it. The man was suffering intense pain, and, on examination, both corneæ showed considerable loss of the superficial epithelium. Cure was effected, as in the above cases, in a short time, pain being relieved within two hours. This patient said that a milder degree of this trouble was common among the workers in the alcohol plant, but the severer cases were rare. He blamed the fumes (formaldehyde, etc.) in the mixing-house, but I feel sure that it was the bright light formed when the retort is first opened, since the charcoal and gases burst into flame, and this has to be faced and extinguished.

In all the above conditions the symptoms were chiefly photophobia and intense pain.

The lesions produced on the retina as a result of *looking at the sun* in eclipse are seemingly those of a burn of the macula. The patient looks directly at the sun and thus the sunlight is focussed on the macula, which is consequently over-heated or burnt by these condensed rays of light. Subjectively, the only symptom is diminution of central vision, which varies from transient haziness to prolonged or permanent damage. Objectively, in my cases, there were dots of pigment with small white areas of atrophy scattered about the macular region, and in one case there was a permanent loss (partial) of central vision, so that the patient had the sensation of looking through a haze.

A similar lesion was produced in the right eye of a student who was working on a geodetic survey, using an acetylene lamp at night to give another man his position. This lamp on one occasion behaved badly, so that he worked and looked closely at it for about two hours. The next day he noticed his sight somewhat hazy, and a day or two later, on trying to shoot with a rifle, discovered that he could not see the sights sufficiently well to shoot. When I saw him several weeks later the vision was right eye 6/18 −; left eye 6/9 +. The right macula was red, with several bright dots near it in the retina. Vision in the right eye finally improved to 6/9 +.

EMERGENCY LIFE-SAVING MEASURES.—Artificial respiration by the prone pressure method is an important life-saving measure in cases of drowning, electrical shock, and acute artificial gas (carbon monoxide) poisoning. The patient must be kept warm. Inhalation of a mixture of 93 per cent oxygen and 7 per cent carbon dioxide is a valuable aid in restoring respiration in carbon monoxide poisoning and related asphyrias. The use of oxygen and carbon dioxide was advocated by Henderson and Haggard in 1922. Drinker called attention to these procedures in 1928, and more recently they have been re-emphasized by the Committee on Poisonous Gases of the American Medical Association. Some physicians still resort to methods of artificial respiration that are less effective. The prone pressure method was first advocated by Schäfer in 1907. Every physician and medical student should familiarize himself with it, be able to apply it, and instruct others whenever there is opportunity for disseminating knowledge regarding first aid. Both electrical shock and drowning produce forms of simple asphyxia. Acute poisoning from city illuminating gas or automobile exhaust differs from them in that the blood is modified by carbon monoxide. In such accidents the heart fails slowly as asphyxia progresses. The ventricles will frequently recover, but recovery is slow. It is unsafe to pronounce an asphyxiated person dead on one examination. Repeated examinations should be made, and the entire absence of pulse and heart sounds, only after a long period of prone pressure artificial respiration, should cause the physician to declare the patient dead. In asphyxia, death should never be admitted until prone pressure artificial respiration has been used for at least an hour. Cases are recorded in which spontaneous breathing has occurred as long as eight hours after artificial respiration has been begun. The prone pressure method is the method of first avail, but as soon as possible an inhalator should be employed for administering oxygen and carbon dioxide. Measures should also be taken to keep the patient warm, and to prevent immediate muscular exercise.—*J. Am. M. Ass.*, March 15, 1930.

Case Reports

HÆMOCHROMATOSIS, DIABETES MELLITUS, PRIMARY CARCINOMA OF THE LIVER

BY W. D. KEITH, M.D., AND
A. Y. MCNAIR, M.D.,

Vancouver

The patient, W.S., died in St. Paul's Hospital, Vancouver, B.C., on September 13, 1927. He was 58 years of age, 5 feet 10 inches in height and weighed 136 lbs.

This patient first came under my observation (W.D.K.) in 1906 when he complained of loss of weight, loss of appetite, heartburn, slight cough, night sweats and lumbago. His urine at that time contained no sugar or albumin. Six weeks' rest from business and the administration of tonics cured his symptoms. From 1906 till 1917 he enjoyed good health; then, in 1917, he became weak and thirsty and consulted a physician who diagnosed diabetes. He worked for eight months and then, not feeling so well, went to California. Shortly after going there a bronzing of the face, hands and feet, forearms and legs was noticed. There was also œdema of the feet and enlargement of the liver. This was followed in a few weeks by an acute attack of rheumatism affecting the left knee and the left hip joints. Subsequent to this the patient suffered from an acute attack of colitis from which he recovered in three months' time.

In December, 1918, Dr. N. B. Potter, in charge of the Santa Barbara Cottage Hospital, made a diagnosis of bronzed diabetes, pulmonary tuberculosis, neuritis and pyorrhœa. A section of skin was removed by Dr. Potter and the pathological diagnosis of hæmochromatosis was made. In 1921 the patient went into coma, being unconscious for twenty-four hours. He gradually recovered though it was several months before he was on his feet again.

On August 27, 1927, Dr. W. D. Sansum, of the Santa Barbara Cottage Hospital, wrote me as follows:

> On August 8, 1923, Mr. S. came to me for insulin treatment. When I increased his diet from about 1,100 calories to 2,200 calories, a violent indigestion set in with undigested food of all kinds in the stool. The abdomen examined in hot water bath was flaccid. There was a mass palpable in the upper abdomen; it moved with each respiration, was very firm, slightly tender and apparently not tightly fixed. It was possible after inspiration to place the fingers under the lower edge. This mass was probably the liver. The lower margin of the spleen could also be felt.
>
> The most probable diagnosis in the beginning was carcinoma of the stomach with extensive metastases to the liver. A gastro-intestinal series showed a lesion of the antrum on the lesser curvature. The pelvis and lower lumbar regions were x-rayed for possible metastasis to the bones. An extensive osteoporosis of all the bones was noted. An Ewald test meal which was given at this time showed no hydrochloric acid in the stomach. The patient promptly recovered under treatment, making our possible diagnosis of cancer improbable.

The family history is of interest in that his father died at the age of 76 of volvulus or kink involving the large bowel, and a few years later his mother died, aged 76 (under the care of one of us, W.D.K.) from cancer of the œsophagus. A sister died of malignant disease when about 20 years of age.

Mr. S. came under observation (W.D.K.) again in August, 1927, his chief complaint being an irregular looseness of the bowels with abdominal pain. On August 19, 1927, he suffered a rather severe hæmorrhage from the bowels, losing more than half a pint on that day. There was no repetition of the bowel hæmorrhage till September 6, 1927, when he passed half a pint of blood. Calcium chloride given intravenously apparently helped to stay further hæmorrhages. His liver was very large, forming a huge prominence over the upper abdomen and lower part of the thorax. By percussion in the nipple line it was 25 cm. wide and extended 10 cm. below the costal margin. In the midline of the body it reached within 6 cm. of the umbilicus. The patient and his wife had noticed a very great increase in the size of the liver prominence during the six months preceding his death. Its lower edge was not hard or nodular, no ascites was made out and there were no dilated veins on the abdominal wall, though some of the veins in front of the chest were quite noticeable. The spleen could not be palpated and no enlarged lymph glands could be felt.

Examination of the chest revealed nothing abnormal; the heart was slightly enlarged with no adventitious sounds present, and the rate was 70. Examination of the arteries showed no apparent sclerosis. The skin of the body was faintly dark and slightly bluish, the pigmentation being slightly deeper on the exposed surfaces—face, hands, forearms, feet and legs.

During his last four years the patient was able to carry on with a diet of 2200 calories and thirty units of insulin daily. Prior to the use of insulin he was very thin and quite restricted in his activities. After its use was established he gained 30 lbs. in weight and led a much happier existence. Sexual power, which was lost in 1917, never returned. There was no history of the excessive use of alcohol, though he took a glass of whisky occasionally.

The pathological examination and report was made by Dr. A. Y. McNair, Pathologist, St. Paul's Hospital, Vancouver.

AUTOPSY REPORT

The body was that of a well developed and well nourished man. The abdomen was protuberant, particularly the upper part, the flanks full and fluctuating on pressure. The skin of the extremities was thickened an dry. The legs were definitely bronzed from the knees down, but no œdema was present. A slight amount of bronzing was seen on the hands and forearms whilst the remainder of the body showed no gross pigmentation.

Abdominal cavity.—The fat was yellow and the abdominal cavity contained six litres of a turbid fluid in which the intestines floated. The upper abdomen and omentum showed an early peritonitis. The intestines were practically empty, containing some gas. The duodenum, all retroperitoneal tissues, mesentery, etc., were very œdematous, soft and friable.

The liver.—The liver was large and very firm. It extended from the fourth interspace to 10 cm. below the costal margin, in the right mammary line. The liver filled the entire right and middle upper abdomen. It was hobnailed in appearance, the surface pebbled and the capsule thickened. It cut with a distinctly gritty feeling and there was a tough and rubbery resistance to the knife. The cut surface was of a marked brownish-orange colour. Scattered throughout were innumerable round or oval whitish islands of tissue, varying in size from a pin point to two or three cm. in greatest diameter. These islands stood out in marked contrast to the rest of the liver tissue and were soft and friable and appeared to have invaded the right lobe of the liver to a greater extent than the left. The liver lobules were very small, irregular and distinct. The cut surface gave a very intense potassium ferrocyanide reaction for iron. The liver weighed 4,318 grm. The gallbladder was thickened and showed adhesions between the fundus and the first portion of the duodenum. There was a puckering of the duodenum at this point which gave the appearance of an old inflammatory lesion.

The pancreas.—The pancreas was thickened, enlarged and firm. It was embedded in an œdematous mass of tissue and fat. There was no evidence of fat necrosis. A large portion was removed with considerable difficulty. The common bile duct and pancreatic ducts were patent and appeared normal. The colour of the organ was distinctly yellow, finely mottled with orange coloured areas.

Retroperitoneal glands.—The retroperitoneal glands were enlarged and firm. They showed some œdema and a marked deposition of pigment. They were distinctly orange brown in colour.

The spleen.—The spleen was double its normal size, fairly soft, congested, the capsule smooth, otherwise it looked healthy.

The kidneys.—The kidneys were normal in appearance. They were slightly enlarged, the capsule smooth and markedly congested. The cortex was pale and the appearance of the kidney suggested a mild nephrosis.

Suprarenals.—The suprarenals were normal in appearance, of equal size, cut readily and appeared healthy.

Prostate and bladder.—Normal.

Stomach, duodenum and colon.—These organs showed surface irritations from early peritonitis. No perforation was found. The duodenum showed two small peptic ulcers near the pylorus. The colon showed a moderate amount of colitis.

Thoracic cavity.—The lungs were compressed by pressure from the abdominal cavity. There was an old pleuritis. The lungs showed œdema and congestion and no glandular or metastatic involvement.

The heart.—The heart showed nothing remarkable. It was normal in size and the position was transverse due to the height of the diaphragm. The muscle was rather soft, but of good colour, and cut readily. The coronaries showed marked atheroma. The aorta showed a well marked atheroma throughout.

MICROSCOPICAL SECTIONS

The study of a large number of sections from many of the organs showed:

Liver.—An extreme degree of unilobular cirrhosis; a marked degree of pigmentation; widely disseminated cancer areas; areas of regenerating liver tissue were also present.

1. The cirrhosis was of the unilobular type, dividing the liver into tiny islands of liver tissue. The normal architecture of the liver was lost. Areas showing the central vein were difficult to find. No normal areas with portal vein, bile duct and hepatic artery were to be seen in the various sections examined. There did not appear to be any definite duct system. The fine bile capillaries were difficult to find and the Kupffer cells were indefinite. Here and there a small mass of bile pigment appeared to be lying free between the liver cells. The cells of the lobules showed a moderate amount of cloudiness and degeneration, this being particularly noticeable in the cells near the periphery. The blood supply did not appear to be distributed according to any definite plan and most of the blood vessels were small (Fig. 1).

2. The pigmentation was very marked. All tissue except the malignant and very young liver cells showed some degree of pigmentation. The stroma appeared to contain the largest

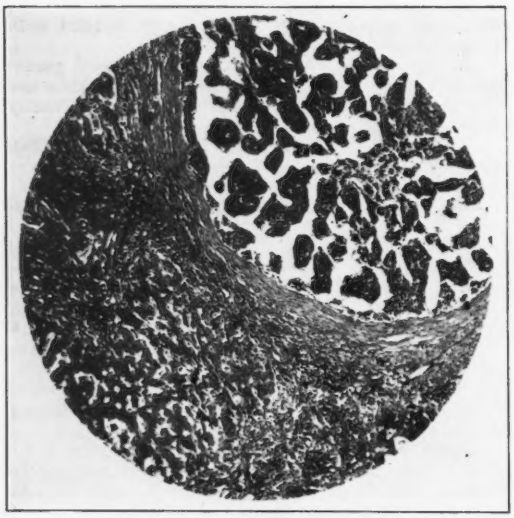

FIG. 1.—Showing unilobular cirrhosis, dense fibrous trabeculæ and an island of cancer with almost a papillomatous appearance.

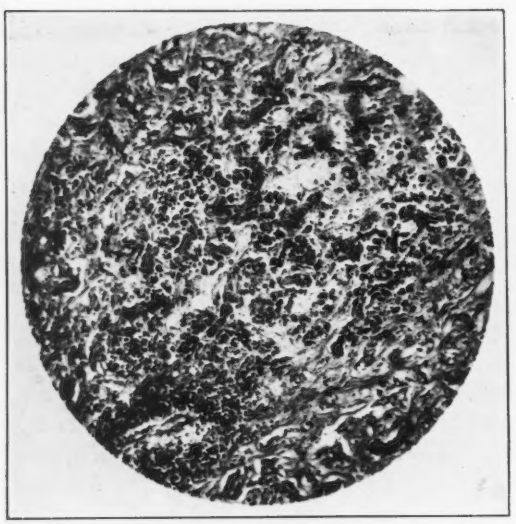

FIG. 2.—Showing dense scarring with a very heavy coarse granular pigment in the stroma. x 150.

amount of pigment. It was found free in between the dense bands of scar tissue which surrounded each individual lobule and widely separated it from its neighbours. The pigment was also contained in large phagocytic cells found in the stroma (Fig. 2). Here and there the pigmentation was so great as to obscure everything, appearing as dense masses of dark brown colour. Where the pigmentation was most intense the amount of fibrous tissue appeared to be greatest. Many sections were stained with potassium ferrocyanide and the reaction was very intense. The liver cells also contained considerable pigment, some more than others. Some lobules were definitely darker than others and the pigmentation appeared to be increased from the central portion to the periphery of the lobule. The cells were often so filled with pigment that everything was obscured but the nucleus. In the areas showing a large number of bile ducts, pigmentation appeared in the cells of the ducts.

3. The cancerous involvement of the liver was shown by innumerable areas of large pale cells, which in many places resembled liver cells, scattered widely throughout the liver. They contained no pigment and were slightly more basophilic than the liver cells proper. The nuclei of these cells varied greatly in size and the chromatin was coarsely granular, hyperchromatic, and took the stain irregularly. The appearance in many places suggested a papillomatous condition where the cells appeared as islands (Fig. 3). The cells were densely packed together and varied in appearance from distinctly columnar to cuboidal or polyhedral in type (Fig. 3). These latter resembled normal liver cells. Multinucleated cells were seen. Many large cords of cells with a delicate stroma suggesting a papillomatous structure were seen. The papillomatous-like arrangement was formed

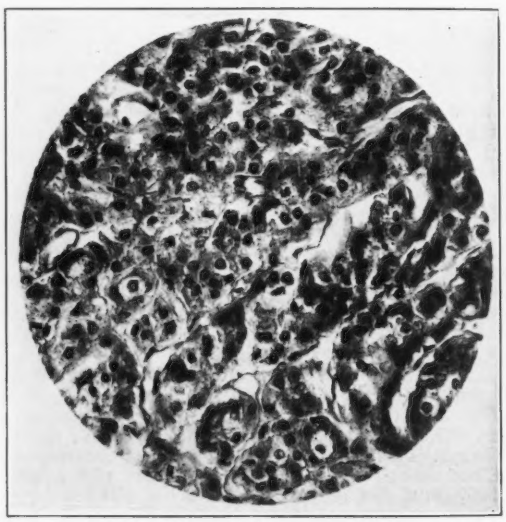

FIG. 3.—Showing large polyhedral type of cells composing cancer masses. In places suggesting cords of cells; and a few intervening spaces.

of cells of a great variety of shape and size. There was no attempt at any bile duct formation nor were any reticulo-endothelial cells seen in these masses of cell growth. This differed greatly from areas of new liver regeneration where bile ducts were very frequently found, usually in great confusion. These cancerous masses were frequently surrounded by fibrous tissue which was part of the general cirrhosis. Many areas showed invasion with malignant cells. No areas were found where these cells appeared to have invaded the blood sinuses, although in a number of places their invasion was strongly suggested.

4. Regeneration of liver cells. There were areas which showed liver regeneration usually small and scattered. These were found in regions which showed a number of proliferating bile ducts which appeared to be making a determined effort to replace damaged tissue. New liver cells were apparent in these areas. They were devoid of pigment and were distinctly more basophilic and showed no definite bile capillary system. The blood supply was derived, as far as could be ascertained, from small thin-walled blood sinuses. Reticulo-endothelial cells were not seen.

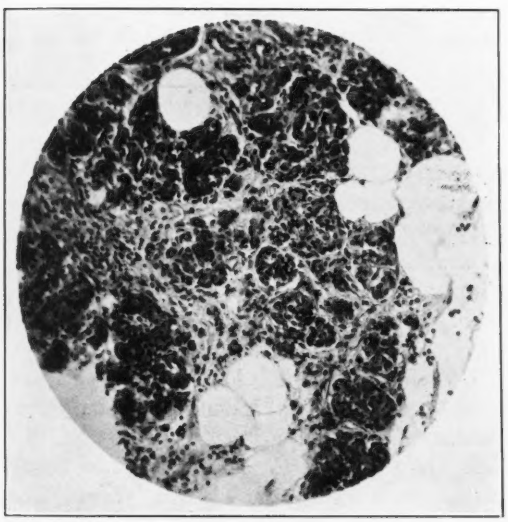

FIG. 4.—Pancreas showing diffuse fibrosis and decrease in pancreatic tissue. Note simple small island of Langerhans in the centre.

Pancreas.—Sections from the pancreas showed a very intense fat and fibrous tissue replacement. The actual amount of pancreatic tissue appeared to be greatly reduced. The islands of Langerhans were few in number and most of them smaller than normal (Fig. 4). The fibrosis had permeated the whole gland and was seen between acini and around the duct system. The pigment was less than in the liver, and was seen in the gland acini, free in the stroma and the fibrous tissue of the gland. The cells of the islands of Langerhans did not show any degree of pigmentation. This is a point which so far I (A.Y.McN.) have not been able to find mentioned in previously reported cases and is important. The loose fat in the outer portions of the gland was infiltrated with polymorphonuclear cells, was œdematous, and showed early inflammatory changes.

Retroperitoneal glands. — These glands were deeply pigmented. The lymphoid tissue was almost absent. The glands were packed full of large phagocytic cells of endothelial type which were themselves filled with brownish granules. In places the pigment was loose in the fine stroma of the gland.

Spleen.—The spleen showed increase of the fibrous tissue. There was a marked passive congestion. The pulp contained a moderate amount of pigment, present, for the most part, in large cells. The degree of pigmentation was much less than that found in the liver, pancreas or retroperitoneal glands.

Kidneys.—There was very little to be seen apart from a slight nephrosis. The cells showed practically no pigmentation. There was a mild arteriosclerosis present. *Suprarenals.*—The section from these glands stained very well but showed nothing remarkable apart from a moderate œdema. There was no excessive pigment and otherwise they looked normal. *Prostate gland and bladder.*—Normal. *Lungs.*—Sections from the base showed a well marked œdema and congestion. There was no evidence of cancer metastasis. *Heart.*—The heart showed a marked degree of myocarditis and arteriosclerosis. The heart fibres showed a very fine brownish pigmentation in the cells. *Aorta.* — Well marked atheroma of the intima with some fibrosis.

SUMMARY OF THE PATHOLOGICAL FINDINGS

1. Hæmochromatosis.
2. Unilobular cirrhosis of the liver, cirrhosis of the pancreas.
3. Primary carcinoma of the liver.

In reviewing the literature of cancer of the liver as a complication of hæmochromatosis we have been able to collect 13 cases besides the one here reported. The cases reported in detail we have assembled in table form.

TABLE

Case	*Author*	*Where Reported*	*Liver Enlargement*	*Duration*	*Diabetes*	*Remarks*
Male, 49	Blanton, W. B.	*Arch. Int. Med.* **27:** 406, 1921	5085 grams	6 months	Yes	
Male, 67	Althausen, T. L.	*Endocrinology* **11:** 377-422, Sept.-Oct., 1927	Swelling of Liver	.....	No	Thought disease followed injury 1½ yrs. previously. Pancreas islands showed interstitial fibrosis.
Male, 64	Hibbs, D. K.	*Tr. Chicago Path.* Soc. **12:** 337, June, 1927	2900 grams	.....	....	
Male, 59	Donaldson, R.	*Guy's Hosp. Rep.* Jan., 1929	Liver moderately enlarged		No	
Male, 58	Keith, W. D. and McNair, A. Y.	*Canad. M. Ass. Journal* **22:** 528, April, 1930	4320 grams	10 years	Yes	Treated with insulin last four years.

Besides these, M. J. Stewart[1] mentions two cases in 6,000 post-mortems at Leeds Hospital, one case of Dunn's unpublished, and three cases he had been able to find in previous literature. E. S. Mills[2] reports three cases of primary liver carcinoma in 17 cases.

Since not more than 130 cases of hæmochromatosis have thus far been reported, this would give an incidence of at least 10 per cent of primary carcinoma of the liver in this disease, an incidence much greater than that found in cirrhosis of the liver, which Counsellor & McIndoe[3] state to be between 3 and 4 per cent.

In view of the fact that T. S. Mallory[4] has been able to produce pigment cirrhosis of the liver in rabbits by administering acetate of copper, we have had the liver from our patient, which has been kept for over a year in formalin, tested by Associate Professor W. F. Seyer, Dept. of Chemistry, University of British Columbia. Professor Seyer, using the method of R. Schönheimer and F. Oshima[5] found the copper content to be 176 mg. per kilogram. This is a much higher copper content than that found in any of the cases reported by Schönheimer and Oshima. These authors found a very definite increase in the copper content of the liver from patients dying from hæmochromatosis, as compared with the copper content of normal livers or livers taken from patients dying from various diseases. They state that their analysis of the copper content of the liver in hæmochromatosis supports the supposition of Mallory that there is some connection between copper and hæmochromatosis.

SUMMARY

1. A clinical and pathological report of a case of hæmochromatosis with diabetes of nine years' duration.

2. The great general improvement in health and strength during the last four years of the patient's life through the use of insulin and the increased diet it permitted.

3. Multiple primary carcinoma of the liver as a terminal complication.

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SUDDEN DEATH FROM PULMONARY INTRA-ALVEOLAR HÆMORRHAGE IN A CASE OF ASTHMA ASSOCIATED WITH PNEUMONIA*

BY H. E. MACDERMOT, M.D.,

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The case reported below presents features which are not readily explicable on either clinical or pathological grounds.

The patient was a married woman, aged 34, who had been attending the outdoor department of the Montreal General Hospital for treatment of her asthma. Her symptoms had developed after an attack of bronchitis four years previously, and had become increasingly worse. There was nothing else of note in her previous history.

She was regarded as a case of bronchial asthma with an underlying bronchitis and an associated emphysema. The upper respiratory tract and sinuses showed no signs of infection, and apart from some pyorrhœa she seemed to be free of any active disease: no sensitization could be elicited by the cutaneous tests. Her pyorrhœa was attended to and she was treated with a stock vaccine. She never quite lost her tendency to dyspnœa on exertion, but on the whole improved considerably and was able to work steadily.

On December 29, 1929, she was suddenly seized with a severe stabbing pain in the left side of her chest, accompanied by cough and the expectoration of brownish-red sputum. There was no definite chill. She stayed in bed for three days and then came to the hospital. When seen in the outdoor department she was cyanosed and in great respiratory distress. The pulse was 132, the respirations 36, and the temperature 99.2°. The examination showed what seemed to be consolidation of the upper lobe of the left lung, with greatly lessened air entry in the lower lobe. A few transient râles only were detected. The right lung showed a marked degree of emphysema. The heart was noted to be markedly displaced upwards and outwards to the left.

The patient was admitted to the ward, where her sputum was found to contain type IV pneumococcus. It was still tenacious and moderately blood-stained. On the day of admission she was given 20 c.c. of Felton's serum intravenously (type IV), a desensitizing dose being administered half-an-hour beforehand. The conjunctival test was also carried out, and it produced no reaction. This dose of serum was repeated the next day. There was no reaction on either occasion. She developed a moderate degree of fever, but the pulse and respirations subsided to the normal limits. By the third day (the sixth day of her illness) her general condition, which had appeared extremely critical on admission, had greatly improved. She lost her cyanosis and dyspnœa, the sputum became loose and mucoid, she slept and ate well, and was cheerful and bright.

The x-ray picture taken on admission showed a dense shadow over the greater part of the left lung field, with no heart shadow whatever to the right of the midline. It was difficult to say from this plate whether collapse or a pneumonic process predominated. Another picture taken a week later showed clearing of the upper two-thirds of the left lung. This, with the physical signs at this time, suggested that collapse and consolidation of the left lower lobe were still present.

Her white cell count was 15,600 on admission, and two days later was 10,800. The other laboratory examinations included a negative blood culture and a negative Wassermann test; albumin and casts in the urine for the first few days only; an increased proportion of blood chlorides at first; absence of tubercle bacilli in the sputum on two examinations.

The patient seemed to be well on the way to convalescence, when on the morning of January 7th, eight days after admission, she suddenly had a profuse hæmorrhage by the mouth and died in a few minutes.

There were no accompanying symptoms of pain or shock or distress of any nature, and it was difficult to account for this fatal hæmorrhage. It was thought possible that there might be some deep-seated new growth in the lung which had caused erosion of a vessel. Ulcerative tuberculosis was also considered, although there had been no positive evidence of its presence. Neither had there been any signs suggestive of an aneurism. There had been no signs or symptoms indicating any gastric lesion, and, to further

* From the medical wards of the Montreal General Hospital, service of Dr. C. A. Peters.

rule this out, the manner of the hæmorrhage pointed to the respiratory tract as the source.

Pathological examination.—This was of note chiefly as regards the lungs, the condition in which may be summed up as follows:—

The left lung showed collapse and consolidation of its lower lobe, the main bronchus of which contained a very dense mucinous exudate, so thick that it could be pulled out of the tube as a solid plug which would stand upright. This lobe was in a condition of advanced purulent bronchitis and acute broncho-pneumonia.

It was in the right lung, however, and the left upper lobe, that the striking pathological changes were found, in the form of widely scattered hæmorrhages. The bronchi and bronchioles contained free blood, and the cut surface of the lung showed very many irregular dark-coloured areas of various sizes, which proved to be localized hæmorrhages. The lung tissue was also markedly emphysematous, and there were small patches of broncho-pneumonia in the left upper lobe.

The other organs were healthy, and no hæmorrhages could be detected elsewhere.

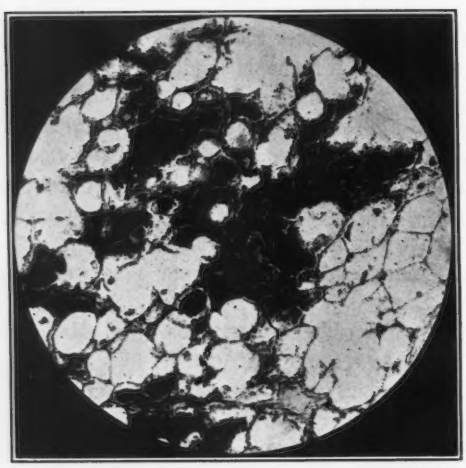

FIG. 1.—Section from right lung. The dark areas are the alveoli filled with recent hæmorrhage; no inflammatory reaction to be seen. This view is typical of the whole right lung and the upper lobe of the left.
(From the pathological laboratory of the Montreal General Hospital)

Whence came this pulmonary hæmorrhage? It certainly was not caused by the rupture of a blood vessel of any size, as a careful examination of the lungs revealed no such lesion. Furthermore, microscopical sections demonstrated quite clearly that the hæmorrhage filled so many of the alveolar spaces as to suggest that they had been flooded simultaneously in both lungs, thus filling the terminal air passages with blood which rapidly flowed into the bronchi. (This fitted in with the overwhelming nature of the hæmorrhage). There was no inflammatory infiltration, apart from the small patches of broncho-pneumonia in the left upper lobe, although in some areas the alveoli contained a homogeneous pale-staining serous exudate. In places free blood could be seen in the interstitial tissues.

To further support the view that the hæmorrhage originated in the terminal air spaces, there was the fact that it was entirely lacking in the left lower lobe, where the alveoli were completely collapsed or filled with pneumonic exudate. The bronchi in this region showed none of the blood found in the bronchi elsewhere, but were filled with inflammatory exudate.

Why did the hæmorrhage take place? There was a possibility of its being a thrombopenic purpura which developed so rapidly to its fatal termination that there was no time for the typical accompanying hæmorrhages to occur in other tissues. Hæmorrhagic infiltration of the lungs in purpura, however, is mentioned as a rarity. The two cases referred to in Osler's Modern Medicine* do not seem to conform with the present case in all particulars. But to decide the point it would be necessary to know whether the platelet count was affected, and this evidence was lacking. Again, this patient had never shown the slightest indication of such a hæmorrhagic tendency.

A more likely explanation has been offered by Dr. L. J. Rhea, pathologist of the Montreal General Hospital. He suggests that this patient died from an anaphylactic reaction produced by the Felton's serum. She received the last injection eight days before her death, which is within the limits of the incubation period for serum sickness to develop. The fact that she was a chronic asthmatic may have been sufficient to convert what would have been an ordinary or even severe serum sickness, into a fatal anaphylactic reaction, with damage to the capillaries in the tissues which presumably had retained most of the serum protein. The fact that she had shown no reaction to horse hair by the cutaneous tests some months before would not rule out the presence of sensitiveness to horse serum. It is true that there were no other signs of an anaphylactic reaction, but this might be explained by the fact the hæmorrhage was too rapid to allow of their development.

(My thanks are due to Dr. L. J. Rhea for his valuable help in studying this case: and to Dr. C. A. Peters for permission to publish the details).

* Vol. v, p. 109.

CONGENITAL WEB OF THE LARYNX*

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Webs of the larynx are comparatively rare. They may be *cicatricial* or *congenital*. The former are the most frequently seen and may be due to the irritation of caustics, intubations, operations or trauma of the upper aperture of the larynx, or to diphtheria and syphilis.

The congenital type is extremely rare and according to StClair Thomson[1] only some 23 cases are on record. A search through the various text-books devoted to oto-laryngology gives little or no information concerning this condition.

Sometimes these webs may cause the patient little or no inconvenience and some surgeons do not advise operative interference unless there is difficulty in breathing or there is not enough mobile cord to produce a good voice. One patient, an adult seen by the writer some years ago, with a well marked laryngeal web, which was accidentally discovered, had always taken part in various games and performed the varied duties of a soldier, with no dyspnœa, and had experienced no inconvenience from its presence.

The presence of sinusitis or diseased tonsils and adenoids, by predisposing a child with this condition to laryngitis, might cause sudden obstruction of the larynx to occur, when breathing would be extremely difficult.

Thomson states that the symptom usually noticed is stridor, which may occur at or soon after birth and may be associated with dyspnœa upon exertion. The child's cry is hoarse, and when speech develops the voice is hoarse and weak.

The web is usually found to occupy the anterior portion of the larynx and in only two recorded cases was it located in the posterior portion. The condition may occur as a rounding of the ordinary acute angle of the anterior commissure of the larynx and occasionally a small fold of membrane may be seen anteriorly in the subglottic region, entirely unconnected with the cords and this may cause no symptoms.

Various methods of treatment have been suggested. The web has been incised by means of laryngeal knives, or by the galvano-cautery. Laryngo-fissure with excision of the web has also been advocated. This has not been always successful, however, as the raw extremities of the cords may grow together again. Jackson[2] considers it important for good phonation to have the anterior commissure free.

Various breathing exercises have been suggested. Humming and shouting by the child have also been advocated with the hope of developing the larynx and improving the voice.

The following case report is therefore of interest:—

Master E. W. (No. 112-26), aged 5 years, referred to the Bronchoscope Clinic of the Montreal General Hospital by Dr. R. R. Struthers.

A history was obtained of chicken-pox and whooping-cough at the age of 2 and measles at the age of 5. There was no history of diphtheria, bronchitis or other respiratory disease. His mother stated that she noticed that, soon after the child was born, he did not cry as other children did, and when the voice developed it was quite hoarse and squeaky. This peculiarity became more noticeable as he grew older. About two months after birth, the mother brought the child back to the doctor who had confined her, but she was assured that he would outgrow the condition. At the age of two he was again seen, but no laryngeal examination was made.

During the next three years the child remained at home but when he commenced school, his voice was so hoarse that he could not talk loud enough to make himself understood. He was subject to "head colds" and sore throats, and it was noticed then that he had a great deal of difficulty in breathing.

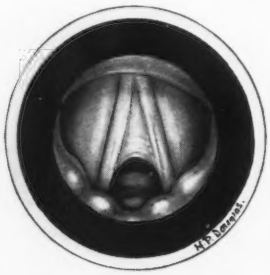
Since the age of nine months the child had been subject to convulsions which occurred at times frequently, but sometimes a year would elapse without an attack, and then four to five attacks would occur in one day. During these seizures the child at first struggled and then became blue in the face, breathing noisily and with seeming difficulty.

* Presented at the Montreal Medico-Chirurgical Society meeting, Montreal General Hospital, December 6, 1929.

The physical examination showed him to be a well developed child of 5. The heart, lungs, abdomen, urine, etc., were normal. He was breathing without apparent difficulty.

His tonsils were diseased and large adenoids were present.

Examination of his larynx both with the laryngeal mirror and by direct laryngoscopy showed a web stretching from the anterior commissure to slightly past the junction of the middle and posterior thirds of the larynx and uniting the free edge of one vocal cord with that of the other. The web was of a pinkish color and membranous in appearance. Upon phonation it appeared to become slightly folded above the true cords.



Drawing made by Miss Douglas through laryngoscope to show the web arising from free borders of true vocal cords. (x 2).

The treatment followed consisted in incising the web along one cord, as suggested by Jackson. A Jackson laryngoscope and laryngeal knife were used. The larynx was then dilated in the usual manner with metal dilators. This was carried out twice weekly for six weeks. No anæsthetic was used.

After two months the child again reported for examination and a slight reformation of the web in the anterior commissure was again incised, and weekly dilatations were performed without any anæsthesia from September until November, 1929. During this time the patient's tonsils and adenoids were removed. When last seen in February, 1930, there was no evidence of any reformation of the web and there have been no convulsions since the treatment commenced. The child's voice gradually improved and although still somewhat hoarse his speech was quite clear and he could easily be understood.

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GANGRENE OF BOTH LOWER EXTREMITIES

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Embolism of the larger peripheral arteries of the body is of very uncommon occurrence and when it does occur is very spectacular. Much has been written on the showers of emboli thrown out on the viscera of the body and their concomitant symptoms, but little is found in the literature on embolic lesions involving the larger peripheral vessels. In six thousand post-mortem records examined by Bull[1] at Rik's Hospital, Oslo, only 15 cases of embolism of the extremities were noted. In 200,000 registrations in the Mayo Clinic only 21 cases of arterial embolism involving the extremities were found. Except in the extremely rare cases where one encounters a patent foramen ovale these emboli practically always come from a thrombus or vegetation in the left side of the heart.

The case which we propose to report is of interest because of the uniform bilateral nature of the lesions without visceral involvement, which would make one suspect other causes for the condition.

Miss L.B., aet. 25 years, Canadian, of German parentage, was admitted to our service at the Royal Alexandra Hospital, August 16, 1929, with extensive gangrene of both lower limbs, extending up to within three inches of each knee. Her temperature was 102.2°; pulse 136; and she was obviously quite septic. The condition was apparently of some standing.

The history obtained on admission was as follows: About six weeks before there had been a sudden onset of acute pain in the right foot and the lower part of the right leg. Turpentine, heat, and other home remedies were used. As a result the pain seemed to abate in the next week, so that

only a little impairment of sensation remained in her toes. Two weeks later, on reaching over for something in bed, she felt a sudden sharp pain in her left leg; she tossed about for two hours and the pain left. A few days later she suddenly sat up in bed with the pain in the left lower limb, including the left iliac region. She was immediately taken to a country hospital, and in three or four days the foot was black, dry, and hard. The right foot also began to show signs of gangrene. The gangrene was apparently later in its onset, as this leg on admission did not show the same extensive necrosis as the left one. There was a rather indistinct history of vomiting at different intervals after the first onset of pain in her foot.

Personal history—She had always been healthy, except for mumps, measles, "flu" in 1919, and whooping cough. She began to menstruate at 18 years of age, every 28 days regularly—flow lasting seven days. She had a normal period in April, flowed one day in May and one day in June, and missed the July period. She seldom had pain at the menstrual period, and on those occasions it was post-menstrual.

Family history.—Essentially negative.

Physical examination.—Cranial nerves negative; teeth, throat, and tonsils negative; glands and thyroid, not palpable. No cough or hæmoptysis. Pulse regular, varying from 100 to 140; blood pressure 86 - 44. There was a small pulsation in the fifth interspace about two and one-half inches from the mid line. On palpation the apex beat was in the fifth interspace about three and one-half inches from the mid line. A palpable coarse thrill was also present in the third interspace about two inches from the mid line, very intense in character. The area of cardiac dullness was not increased. Auscultation revealed the absence of the second sound at the apex and a soft blowing murmur, systolic in time in this region, which was not crescendo in character. Over the area of the palpable murmur, and radiating outwards for a radius of one and one-half inches, a loud diastolic murmur was present. The chest examination otherwise was negative.

No palpable tenderness or tumour was noted in the abdomen. The genito-urinary system was negative.

The left leg below the junction of the upper and middle thirds, and the whole foot, was in a state of dry gangrene and mummification. At the upper and posterior border there was a definite line of demarcation with some sloughing in this area.

The right leg and foot were involved to the same extent in this area, the toes alone being mummified, the rest of the involved portion being cold, but the skin was still comparatively soft and of a dark colour. The line of demarcation in this leg was less distinct and there were a few blebs on the involved region filled with clear colourless fluid. The veins on the anterior aspect of the left leg and dorsum of the foot stood out as dark brownish-red lines on a semi-translucent background of a lighter hue. The veins of the right leg and foot on the other hand were merely of a more intense blue than normal.

FIG. 1.—Picture of the legs taken shortly after admission to hospital.

Laboratory findings.—The urinary and blood examinations including the Wassermann test, were negative.

Progress of illness.—Her pulse never dropped below 100 and was usually around 120. Her temperature fluctuated from normal to 102°, rising in the afternoon. The condition progressively became worse, and in view of her cardiac condition it was not deemed advisable to attempt amputation, which would have in all probability hastened the end. She was given glucose in saline by means of intravenous in-

jections and by hypodermoclysis, along with high caloric liquids which were given copiously. The patient lived for thirteen days after admission to hospital. Her death was due to toxæmia.

Autopsy.—The post-mortem was done 20 hours after death. The body was that of a moderately well nourished female about 30 years of age. Both lower extremities showed marked gangrene extending up to about three inches below each knee; the left side seemed to have undergone a more marked degree of necrosis and sloughing than the right, the tissue being open down to the bone in areas. There were several interstitial and intravenous marks in her chest and arms.

Permission for only a partial post-mortem was obtained, and as a result it was necessary to remove the organs from a small opening in the abdomen.

On opening the pericardial sac there were about forty c.c. of clear straw coloured fluid; the visceral and parietal pericardium were glistening in appearance. The great vessels showed no abnormalities. The heart

FIG. 2.—The left ventricle exposed showing the extensive vegetative process involving the mitral and aortic valves, also the mural endocardium.

weighed about 450 grams. There was a moderate amount of epicardial fat. The heart muscle on section was pale reddish in appearance. No abnormalities were noted in the tricuspid and pulmonary valves. The mitral valve showed the presence of numerous friable sessile excrescences, projecting from the free edge of the anterior valve leaflet into the lumen of the bicuspid orifice. These vegetative projections were present also on the endocardium beneath the posterior valve leaflet. The aortic valve was distorted due to thickening of the free edge of the cusps in places, also due to several clusters of vegetations hanging from their under surfaces.

There were no pleuritic adhesions on either side. The lungs were air-containing and spongy throughout, except for some evidence of hypostatic congestion in both bases.

The peritoneum was smooth and glistening throughout. There was no increase in the peritoneal fluid. The spleen was considerably enlarged, being about twice its normal size. On section, it was found to be soft and spongy throughout. There was no evidence of infarction. The kidneys were normal in appearance. On section, nothing abnormal was noted, with the exception of cloudy swelling. The gastro-intestinal tract was essentially negative. The liver was negative.

Close examination of the pelvic veins revealed no evidence of thrombosis. Exploration of the aorta, iliac and femoral arteries showed no emboli or thrombosis to be present.

Microscopic findings.—Sections taken through the valve leaflets showed the surface of the endocardium to be covered with a thick fibrino-purulent exudate, enclosed in which were numerous clumps of cocci. The vegetations were apparently made up of masses of fibrinous nature containing clumps of bacteria. This description conformed to that given by Libman,[2] Clawson[3] and others of acute bacterial endocarditis.

Cause of death.—Primary; acute bacterial endocarditis followed by embolic gangrene of both lower extremities; immediate, toxæmia.

COMMENT

Here we were confronted with a condition of six weeks' standing with the result that the patient was extremely toxic. In view of her cardiac condition in addition to her general state, operation was out of the question; besides, we could see no good reason for operation when it did no more than remove the result of the condition. The diagnosis of acute or subacute bacterial endocarditis was further obscured by the presence of a constantly high temperature, which was attributed to the intense septic absorption which was taking place. The possibility of a ball embolus was considered in the presence of the cardiac condition.

It seemed extraordinary that, if this was an embolic phenomenon, it could have such bilateral symmetry without clinical symptoms of embolism elsewhere. The post-mortem findings were interesting in that a careful search for embolic manifestations other than those found in the legs were not forthcoming. The spleen and the kidneys, usually the site of multiple infarcts in such cases, were singularly free. A point emphasized by Clawson, that often in cases of acute or subacute bacterial endocarditis there is more or less involvement of the mural endocardium, was nicely illustrated.

Unfortunately in this case there was no blood culture taken.

SUMMARY

A case of acute bacterial endocarditis is presented having embolic dry gangrene involving both lower extremities equally, without evidence of embolism elsewhere.

In closing we wish to acknowledge the help given us by Mr. A. S. Gelfand, interne, whose interest in this case whilst in hospital enabled us to investigate it more closely.

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A CASE OF DIVERTICULUM OF THE URETHRA IN THE FEMALE

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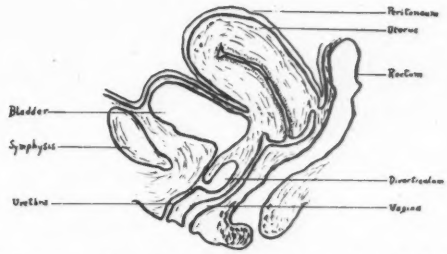
The patient, referred by Dr. W. R. Caven, came complaining of recurrent attacks of inflammation of the bladder occurring over a number of years. In fact, she had difficulty in remembering when she had normal bladder function. She had one child, now 18 years old, born by normal delivery. In addition to the recurrent attacks of inflammation of the bladder she had a bearing-down feeling through the pelvis, which she thought was due to some uterine prolapse. On one occasion when she visited her doctor, after voiding, the doctor was able to remove nine ounces of residual urine from the bladder.

On physical examination there was a bulging in the anterior vaginal wall resembling very much that produced by cystocele. The uterus was low in the pelvis and, with a tenaculum, one was able to deliver the cervix to the vaginal entrance. The tubes and ovaries were normal. During a bimanual examination it was noted that pressure on the anterior vaginal wall caused a considerable quantity of pus to escape through the urethra.

Cystoscopic and urethroscopic examination was made by Dr. Robin Pearse. Dr. Pearse reported that the bladder showed a small amount of cystitis at the base. There was also some reddening around the left ureteral orifice. The bladder urine was clear and, at the time of his examination, he found only one and one-half ounces of residual urine. With the urethroscope he was able to demonstrate that there was a definite pouch or diverticulum emptying into the urethra midway between the external and internal urinary meatus, the opening being on the posterior wall of the urethra, its orifice about equal in size to that of the internal urinary meatus. This diverticulum or pouch passed upward and backwards towards the base of the bladder, being about two inches in depth and estimated to have a capacity of from 8 to 10 c.c.



Following this examination it was decided that we were dealing with an urethral diverticulum, which, to relieve the patient's symptoms, should be removed.

Through an incision extending from 1 cm. posterior to the external urinary meatus to the mid part of the anterior wall of the vagina, I was able to expose without any very great difficulty the entire diverticulum, which was jug shaped. With a sound in the bladder and a second sound in the diverticulum, I was able to define the anatomical structures, particularly the anterior and posterior urethra. This greatly facilitated the removal of the diverticulum. The opening in the urethra was closed, the anterior vaginal wall was closed and a retention catheter left in the bladder.

PATHOLOGICAL REPORT (by Dr. J. E. Bates)

"*Diagnosis.* — Urethrocele, with acute and chronic inflammation. The gross specimen consists of a cystic mass measuring 2.5 x 2.5 x 1.5 cm. This is constricted at one point where there is a well formed lumen. The inner lining of the sac is irregularly congested and granular in appearance.

Microscopically, sections show mere remnants of the lining epithelium. The inner wall of the cyst consists almost entirely of granulation tissue which is masked with an extensive infiltration of polymorphonuclears, lymphocytes, and endothelial cells. The periphery of the sac is made up of very dense fibrous tissue."

Retrospect

THE VITAMINS*

BY C. H. BEST AND E. W. MCHENRY

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The fundamental fact that heat production within the body is due to the oxidation of food was established by the celebrated French chemist and physiologist, Lavoisier. This realization of the significance of oxygen was followed by a very rapid development in the knowledge of the physiology and biochemistry of nutrition. Toward the end of the 19th century it seemed as though the major facts in nutrition were understood. The requirements of any individual could be expressed in terms of protein, fat, and carbohydrate, and inorganic salts. The caloric value of the various foods could be calculated.

The pioneer work of Eijkman, Grijns and others, in broadening the above conception of nutrition, will be referred to under Vitamin B. The credit for the clear-cut proof that carefully purified protein, fat, carbohydrate and inorganic salts are not the only essentials for an adequate diet belongs to the father of British biochemistry, Sir Frederick Hopkins, who shares with Eijkman the recently awarded Nobel prize in medicine. The well known experiments of Hopkins demonstrated that minute amounts of an accessory factor were necessary for growth of young animals. The work of the vitamin experts has now provided us with at least six separate vitamins each of which we will discuss briefly.

The history of vitamin deficiency in Canada dates from the year 1535, when Jacques Cartier wintered at Stadacona. During the winter the French crew was almost annihilated through scurvy and was only saved by using a decoction of the spruce or white pine recommended by the Indians. It is certain from his account that Canadians have been interested in the deficiency diseases for nearly four hundred years. The bark and foliage of the white pine are still used in certain parts of Canada as a source of the antiscorbutic principle.

It is very difficult to ascertain to what extent deficiency of the various vitamins prevails in Canada at the present time. There are undoubtedly great differences in different parts of the country. There are indications that steps are being taken which will give us information on these points. It is imperative that the vitamin content of Canadian foods be more fully investigated. We have relied too much in the past on the results obtained by scientists working in the United States with foods which may differ greatly in their vitamin content from those available in this country. We can obtain an approximate idea of the prevalence of certain of the deficiency diseases by an examination of hospital reports. The figures given below are those from the Hospital of Sick Children, Toronto. We are indebted to Dr. F. F. Tisdall for placing these at our disposal.

	Total Number of Admissions	*Rickets*	*Scurvy*	*Tetany*
1919.....	5,065	93	15	34
1920.....	4,983	141	10	25
1921.....	5,277	104	5	11
1922.....	5,619	122	13	12
1923.....	6,346	103	11	10
1924.....	6,397	130	7	31
1925.....	5,946	153	7	27
1926.....	6,042	132	13	31
1927.....	5,772	89	13	6
1928.....	5,808	88	6	32

The incidence of rickets is probably much higher than these figures indicate, since many cases of mild rickets complicating other conditions are not included.

VITAMIN A

While this is the first vitamin from the point of view of name, it is the second from historical considerations. Experimental work upon the anti-neuritic vitamin preceded investigations of A, which is the first of the three fat-soluble vitamins. These fat-soluble vitamins are associated with the fatty constituents of foodstuffs and are soluble in fat solvents.

As early as 1881 Lunin, in Germany, had found that artificial mixtures of proteins, fats, carbohydrates, mineral salts and water, could not be successfully used for rearing animals, but that animals could grow normally if milk were added to the diet. In 1906 F. G. Hopkins, as mentioned above, came to the same conclusion and stated that there was contained in the milk a substance essential for growth. Stepp, working in Hofmeister's laboratory, in 1909 arrived at the same conclusion, which was again confirmed in 1913 simultaneously by McCollum and Davis and by Osborne and Mendel.

There soon became apparent two obvious effects attributable to a deficiency of the fat-soluble factor in the diet; failure to grow, in the case of young rats, and ophthalmia. These are the characteristic results produced when animals are fed upon an A-deficient diet. The best sources of this vitamin were found to be fats of an animal origin, milk, butter and cod-liver oil. It was not found in vegetable fats, such as cottonseed oil, but it was present in large quantities in green leaves and in actively growing

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portions of plants. Higher land animals are able to store vitamin A in their tissues, but they are unable to synthesize it and must secure their supplies from green plants, directly or indirectly.

Considerable evidence accumulated, in connection with the vitamin A content of plant tissues, that the vitamin was associated with pigmentation, more particularly with carotene, a common plant pigment. J. C. Drummond fed experimental animals purified carotene and could detect no vitamin A. More recently, however, the question has been reopened and further data advanced to show some relationship between vitamin A and this pigment. A common vegetable, the carrot, rich in the pigment, carotene, contains also a large amount of vitamin A.

A question of practical importance in connection with any of the vitamins is the stability toward heat. Obviously the vitamin content of cooked foods is a matter of prime interest. Vitamin A withstands heat remarkably well in the absence of air; the A content of egg yolk remains unchanged after hard-boiling the egg. Foods heated in the air lose vitamin A rapidly as a result of oxidation accelerated by heat.

Like the other fat-soluble vitamins, A is contained in the unsaponifiable portion of the fats. Several years ago Takahashi reported that he had isolated vitamin A in a fairly pure form. He named his product "Biosterin." Animal tests showed it to be a very potent source of the vitamin but in view of the later work it is probable that the substance Takahashi assumed to be pure vitamin was in reality vitamin contaminated by several impurities. J. C. Drummond and his colleagues have prepared extremely potent fractions from the unsaponifiable portion of cod-liver oil and other oils. The vitamin itself has not been isolated.

The vitamins are characterized and assayed by means of tests on animals. These animal tests are slow and to secure a measurement of the vitamin content of any material is expensive and time-consuming. A method, perhaps chemical, which would enable the vitamin content to be determined quickly would be of great value. Several colour tests have been proposed for the vitamins but in most cases they have been proved to be meaningless. In 1925 Rosenheim and Drummond suggested a reaction by which vitamin A could be determined by the colour produced with arsenic trichloride. This colour test has been investigated by several groups of investigators and it seems to give results comparable to those obtained by the animal method of assay.

Measurements of the absorption spectra have played an important rôle in the identification of vitamin D and, spurred on by these successes, several workers have made similar measurements with vitamin A. As a result it has been suggested that there may be some connection between the two vitamins. D has been identified as activated ergosterol; A may be a sterol and perhaps intimately related to D.

The two characteristic effects produced in animals by deprivation of A have previously been mentioned, lack of growth and ophthalmia. The eye condition is apparently not due directly to the absence of vitamin but is an infection able to exist because deficiency of vitamin A produces a general susceptibility to infections. It is interesting to note that in an African expedition in 1857, Livingstone noted the appearance of xerophthalmia produced by a scarcity of butter and other animal fats. Several reports of eye affections in English industrial schools attributable to lack of vitamin A have been published. Lack of vitamin A has been said to cause night blindness and this has been treated for many years by the natives of Calcutta by feeding liver, a good source of vitamin A. One is struck, frequently, in the study of the vitamins, by the fact that therapeutic measures now established by scientific research were used empirically by primitive peoples.

During the past two years the work of Minot, Murphy, and associates at Harvard Medical School, on the alleviation of pernicious anæmia by feeding liver and liver extract, has come into great prominence. At this same time when preliminary announcements were being made from Harvard, Koessler and his associates at Chicago stated that pernicious anæmia could be successfully treated with high caloric diets, containing an abundance of vitamin A. The rationale for such therapy was explained by them in the following way. Pernicious anæmia was due to an absorption from the intestine of toxic substances produced by bacteria. It had been known for some time that lack of vitamin A lowered intestinal motility and caused degenerative changes which would render the intestinal wall more permeable. Pernicious anæmia might then be brought about by lack of the vitamin stores and it could be treated best by feeding vitamin A. The diet which Koessler *et al.* recommended appeared to be successful, but the work done by Cohn and others on the substance present in liver has cast doubt on the hypothesis that vitamin A is the important factor. Fractions of liver extract containing no vitamin A alleviate pernicious anæmia in a characteristic manner.

It has been frequently observed that laboratory animals suffering from vitamin A deficiency are rendered more susceptible to infection. Last year Green and Mellanby described experiments definitely leading to such a conclusion and indeed suggested that this vitamin be named "anti-infective." Beneficial effects upon animals led them to administer vitamin A to patients suffering from puerperal septicemia. Only a limited number of cases were reported but the results are suggestive and have excited great interest.

VITAMIN B

From the historical viewpoint, this vitamin is very interesting. Much of the early work carried out upon deficiency diseases was upon

beri-beri, which is now believed to be due to lack of vitamin B in the diet. From this work there arose, indeed, the name vitamin, originally spelled with a final "e" and coined by Casimir Funk as a name for the dietary factor which cured polyneuritis. Moreover the first deficiency disease to be produced experimentally in animals was caused by feeding a diet deficient in this vitamin. More extensive work has been done upon B, than upon any of the other vitamins, but despite this our knowledge is woefully incomplete.

Beri-beri is a disease known from earliest times and one formerly encountered with some frequency. So extensive was it in the Dutch East Indies in the latter part of the 19th century that a commission was appointed for its investigation. One of the workers, Eijkman, in 1889, observed that there could be produced in fowl a disease similar to human beri-beri by the feeding of a diet of polished rice. He cured the disease, the first to be experimentally produced by a dietary deficiency, by giving the birds the seed coats of rice. He erroneously concluded that there was a toxic substance in rice, the effect of which was neutralized by something present in the seed coat. Grijns, a few years later, advanced the correct explanation that the disease was due to a dietary deficiency.

In 1911 Casimir Funk isolated from the coatings of rice grains a concentrated fraction which would cure experimentally produced polyneuritis. He named this "vitamine" because it appeared to be a nitrogenous base of amine character, essential for life. McCollum and Davis in 1915, demonstrated the necessity of a water-soluble factor for the growth of rats. This seemed to be identical with the antineuritic vitamin and in the ensuing years it was tacitly understood, but never definitely proved, that they were the same. The vitamin thus studied was called water-soluble B. Two effects were attributed to it; antineuritic and growth-promoting.

Evidence gradually accumulated from many sources that these two effects were not due to a single substance, and Mitchell in 1919, summarizing the existing literature, advanced the view that the two effects were due to two separate factors. It is now generally assumed that the factor hitherto designated as vitamin B is of complex nature. This has been further strengthened by work upon pellagra.

After some years of investigation, with the elimination of several possible causes, Goldberger and his associates came to the conclusion that pellagra is a dietary deficiency disease and can be cured and prevented by the presence in the diet of a factor which seems to be allied with the growth promoting element of vitamin B complex. In 1925 Goldberger and Tanner found that fresh meat and milk contained a pellagra-preventing material which they termed "P-P." Their work has encountered considerable opposition and two schools of thought have developed as to the cause of pellagra. Last year Underhill and Mendel announced that pellagra-like symptoms in dogs could be cured by a fat-soluble substance which they claimed in no way resembled the P-P factor of Goldberger. Goldberger's results, however, are so conclusive, not only from animal experiments but also from human investigations, that it is generally believed that associated with the vitamin B complex is a substance which prevents and cures pellagra.

The multiple nature of vitamin B has led, as one might expect, to some confusion in terminology. A number of designations have been proposed for the different constituent factors and two attempts have been made to secure an agreement, one in Britain and one in the United States. The Accessory Food Factors Committee, representing the Lister Institute and the Medical Research Council of Great Britain, proposed that the designation vitamin B be used as a blanket term for all dietary factors belonging to this group of water-soluble vitamins; that vitamin B_1 be adopted for Eijkman's thermolabile antineuritic substance; and that vitamin B_2 be applied to the thermostable pellagra-preventive of Goldberger. A committee appointed by the American Society of Biological Chemists to consider this dilemma preferred not to designate the factors as subsidiary members of a complex, but rather to consider them as entities. Accordingly vitamin B is named as the antineuritic, thermolabile factor, while vitamin G denotes the thermostable pellagra-preventive substance. It would be fortunate if international agreement could secure one set of nomenclature and thus aid in classifying vitamin literature which is now so complicated.

Many biochemists have endeavoured to secure vitamin B, the complex, or its constituent factors, in purified form, mostly without success. In 1927 Jansen and Donathi, working in the same laboratory in which Eijkman performed the initial work upon the vitamin, prepared crystals which they believed to be the pure antineuritic principle. Kennedy and Peters, repeating the methods, were unable to substantiate the results.

In a recent discussion of the nutritional questions raised by the discovery of the multiple nature of vitamin B, H. C. Sherman has pointed out some of the essential difficulties. There is considerable literature on the distribution of B in foodstuffs. What is the present value of such data? Obviously, much of it is valuable. In cases where it has been reported that a particular food contained the antineuritic factor, or the growth-promoting or pellagra preventive factor, we can utilize such positive data. The two factors differ in a most important property, heat stability, and it may well be that workers, seeking for one particular effect, have not found it, and have reported a particular source as negative. The other factor may have escaped attention. Consequently considerable work must now be done to determine the content of both factors in various foods. The tables of vitamin content must be revised in the light of the newer know-

ledge. This is a matter of considerable value to those interested in nutrition. We must not forget that, while disease due to a deficiency of the vitamin B factors may seem foreign to this country, a fairly recent experience, not so far distant, indicates that these vitamins must be maintained in adequate amounts in the diet. In 1914, an outbreak of beri-beri occurred in the jail at Elizabeth, N.J., as a result of deficiency in the antineuritic principle in the diet supplied to the prisoners. As Plimmer has repeatedly emphasized, certain slight deviations from the normal in human individuals, may be attributable to a deficiency of the B-complex.

VITAMIN C

There are several references to scurvy in Canadian history in addition to the one we have mentioned in the introduction. The Sieur de Monts party, wintering on the small island of St. Croix in 1604, suffered severely and apparently were not familiar with the remedy used so successfully by Cartier. Champlain was with de Monts and tells the story of that winter.

Progress in the investigation of scurvy was slow until it was discovered that experimental animals develop the condition when placed on certain diets. In 1895, Theobald Smith observed the development of scurvy in guinea pigs limited to a diet of oats and bran. Holst and Frölich, in 1912, showed that these animals readily develop scurvy when confined to a diet of cereals or bread. Experimental scurvy can thus be readily produced and recent advances in this field owe much to this discovery. Certain species of animal are apparently immune to scurvy. It cannot be produced in rats. Pigeons and several other species of birds apparently do not require vitamin C. Vitamin C is destroyed by fairly mild oxidizing agents. It is also readily inactivated by heat. Alkalinity is very destructive to it also. The actual substance is more stable in acid solution. Canning under appropriate conditions does not destroy the antiscorbutic activity. Canned tomatoes are usually very rich in vitamin C. The destruction of the vitamin during the canning is usually due to oxidation rather than heat. Germination of seeds often results in the production of this vitamin.

The best sources of vitamin C are tomato juice, orange or lemon juice, fresh vegetables and milk from cows feeding on fresh green food. A concentrated preparation can be made available if it is required. This would have been a great boon to the members of the MacAlpine party who suffered from scurvy during their recent Arctic adventures. Scurvy in infants is a fairly frequent occurrence, as the figures given in the introduction show, but does not usually develop in infants before 9 or 10 months of age. Pasteurization of milk has probably increased the frequency of scurvy, but the addition of an antiscorbutic factor to the diet is an easy matter and is now happily becoming common practice.

VITAMIN D

In the year 1918 Dr. Edward Mellanby of Sheffield, England, proved that rickets is what is known as a "deficiency disease." Mellanby's original discovery revealed the fact that there was an antirachitic factor which could be dissolved in oil or fat and was present in the fat of certain animals. In the absence of this vitamin from the diet animals developed all the signs of rickets. It was thus established that rickets could be produced by the fat soluble substance and could be prevented or cured by administration of this material. The Glasgow school, among others, did not accept Mellanby's conclusions and continued to insist that the lack of sunshine and fresh air were the causative factors in the production of rickets.

As soon as the war ended the British Medical Research Council, in collaboration with the Lister Institute of Preventive Medicine, sent a group of workers to Vienna to assist in the relief measures and to study the situation which was responsible for the very high incidence of rickets. Dr. Harriette Chick and her associates, the members of the British group, administered cod-liver oil to large numbers of Viennese children who were afflicted with rickets. In confirmation of Mellanby's work it was found that this treatment produced a great improvement in the condition of the children. Dr. Chick and her associates noted that in the winter only the children who received the oil showed improvement, while in the summer children who did not receive the oil also recovered from active rickets. After a splendid series of experiments Dr. Chick came to the conclusion that in some manner the rays of the summer sun exerted this curative effect.

During this same period Dr. Huldschinsky of Berlin was also working on rickets. He made the remarkable discovery that when he exposed a rachitic child to the quartz mercury vapour lamp recovery took place. As a result of these findings the scientific world realized that certain radiations, either solar or from an artificial source, and a substance in cod-liver oil, could cure rickets. These two factors were soon connected. Professor Steenbock, of Wisconsin, and Professor Hess, of New York, simultaneously, showed that it was not necessary to irradiate an animal to cure rickets, but that exposure of the animal's food to a source of ultraviolet radiations was effective. Attention was thus directed to substances in which vitamin D could be developed by the action of the short wave length radiations. It had been found that the antirachitic vitamin was present in the unsaponifiable portion of cod-liver oil. The chief constituents of the non-saponifiable fraction of fats are the class of substance known as sterols. The principal sterol of the vegetable kingdom is sitosterol, and of the animal kingdom, cholesterol. Cholesterol is present in all living cells and is rendered antirachitic by irradiation. It was therefore thought that cholesterol was acted upon by ultraviolet

light to produce vitamin D. Cholesterol is present in the skin and it was supposed that the short wave lengths which are known to be blocked by very thin layers of solid material, penetrated sufficiently to activate this cholesterol which is then transferred in the blood stream to all parts of the body. It seemed as if the chemists had only to discover the change which took place in cholesterol on irradiation to understand the secret of vitamin D. But the secret still resisted solution. The next great step was made by Rosenheim and Webster, of the National Institute for Medical Research, Hampstead, London. They discovered that cholesterol purified by certain procedures could not be activated. They also showed for the first time that ergosterol, a contaminant of most samples of cholesterol, was the substance on which the ultraviolet light exerted its effect. Ergosterol appears to be the actual mother substance of vitamin D. Part of the credit for this discovery belongs to Professor Windaus, of Göttingen, who had been interested in ergosterol previously and who collaborated with Rosenheim and Webster. Professor Hess, of New York, and Professor Heilbron, of Liverpool, have also contributed to this development.

Ergosterol is a white crystalline substance, first isolated by the French chemist Tanret from the fungus ergot of rye. Subsequently it was found to be quite plentiful in the fat of certain yeasts. Yeast is now the source from which large quantities of ergosterol are being secured. Ergosterol is a complex compound, the exact composition of which is unknown, but it differs from all other known sterols in having three unsaturated double bonds. After a brief period of radiation, ergosterol changes from a white crystalline solid to a pale yellowish oily substance. Irradiated ergosterol is extremely potent and possesses 100,000 times the antirachitic activity of the same weight of the strongest cod-liver oil. A daily dose of one-hundredth million of a gram, or even less, is sufficient to produce healing of rickets in rats. The dose for children is about 1 mgm. per day. Further clinical work may change this figure slightly.

Numerous clinical reports have now appeared on the use of irradiated ergosterol. All the observers agree that this substance is by far the most potent of the antirachitic agents. It is reported to be quite as valuable in infantile tetany as in rickets, and is remarkable in the treatment of both disorders for the rapidity as well as the reliability of its action.

The use of accurately standardized irradiated ergosterol has solved some of the difficulties associated with the treatment of rickets. On the other hand much greater care must be exercised in the administration of this very potent substance than in the use of less active preparations of vitamin D. Several reports have already appeared on the condition of hypervitaminosis. It has been reported that massive doses (100,000 times the amount adequate for the protection against rickets) produce certain ill effects. Extensive depositions of calcium in the body and a generalized sclerosis have been reported. Certain of the toxic effects of massive doses of irradiated ergosterol may be due to the impurities or to the decomposition products produced during the irradiation of ergosterol in certain media or to the too prolonged irradiation in any medium. It has been established, however, that doses of irradiated ergosterol several thousand times as large as the adequate amount can be given for long periods to rats without the appearance of any abnormal signs or symptoms.

If the proper dose of irradiated ergosterol is used, and several well known pædiatricians have conducted investigations on this point, no harmful effects need be feared. Within the past few months the Council on Pharmacy of the American Medical Association has adopted certain regulations regarding preparations of irradiated ergosterol. Such preparations are to be known as "Viosterol" and are to be standardized by definite biological procedures. They have arbitrarily defined the unit of vitamin D, and the potencies of cod-liver oil and "Viosterol" preparations are to be expressed in terms of this unit.

There are two reasons why special interest is attached to vitamin D. The Canadian physician is more often called upon to treat rickets than any other vitamin deficiency disease. The second reason is that chemists have advanced so much further in the understanding of the constitution of this vitamin than of any other. It is fascinating to realize that the rapid advance of the last few years has brought us to the point where we confidently await the revelation of what chemical change takes place when a readily available inert substance is converted into an extremely potent antirachitic agent by a few minutes' exposure to ultraviolet radiation.

VITAMIN E

It was found by Herbert M. Evans and associates at the University of California, in 1922, that rats reared on diets of synthetic materials containing ample amounts of vitamin A and B, lived and grew apparently normally but became sterile. The sterility was proved to be due to the absence of a dietary factor, and could be prevented or cured by the addition of certain foods to the diet. At the time Evans named this factor vitamin X, the anti-sterility vitamin, but several years later the designation was changed to E, in accordance with the conventional nomenclature for vitamins.

One must emphasize, in considering this vitamin, the peculiar type of sterility which results from its deficiency. Sterility, particularly in the male, may frequently occur as a consequence of the deficiency of other vitamins. The absence of any other vitamin will not cause the conditions produced by a lack of E. These conditions are: in the male, a gradual destruction of the germ cells; and in the female the death and resorption of the developing young during gestation. The sexual cycle of the female is not markedly

changed, as may be the case when the diet is otherwise deficient. These "resorption gestations," to use the term employed by Evans, are characteristic of E deficiency.

Based on this definite observation a search was made by Evans and his associates for this vitamin in various food stuffs. Generally speaking animal tissues are poor sources. Cod-liver oil which is such a potent source of A and D, contains little E. Vegetable materials are, on the other hand, particularly rich sources of E, and this is especially true of green leaves and seed germs. The two most valuable sources of this vitamin, for experimental purposes at least, are wheat germ oil and lettuce leaf. It is fairly well distributed in common foodstuffs.

Certain properties of vitamin E are of interest. It seems to be the most stable vitamin, being resistant to heat, mild oxidation, and chemical treatment. The leaves which contain it may be dried without loss of this factor. It is intimately associated with the fats and hence is said to be fat-soluble. This vitamin, like A and D, the other fat-soluble vitamins, is found in the non-saponifiable fraction, but unlike these two it does not appear to be a sterol.

In 1927, a paper from the laboratory of E. V. McCollum dealt with the possible relation of vitamin E to iron metabolism. This author and his associates attributed the faulty gestation in rats to a crisis reached in their iron metabolism. This crisis could be prevented by the administration of either vitamin E or ferric citrate. A ferrous salt did no good, and was actually harmful. On the basis of these experiments McCollum and associates suggested that the value of the Minot-Murphy diet for pernicious anæmia was due to the richness of the liver in iron and vitamin E.

Karl Mason has investigated the effect of E on iron metabolism more fully and has found that administration of E has no effect on the blood picture. His work indicated that the vitamin has a specific effect on the germinal epithelium of the testis in the male, but has no effect on any other tissue. There appears to be no relationship whatever between E and iron metabolism.

Early in 1928 Herbert Evans and Burr reported a remarkable effect due to the absence of E from the diet of rats. Young mothers may not be rendered completely sterile by deprivation of E, or litters may be born by supplying small amounts of the vitamin. The young thus born grow well for a few days and appear to be quite healthy. About the fifteenth day paralysis of the upper motor neurone type sets in. The disease, once produced, cannot be cured by supplying any dietary factor, but it can be prevented by the administration of E in the form of wheat germ oil. No other vitamin will accomplish this and the paralysis appears to be specifically due to the lack of E.

More recently the effect of vitamin E upon growth has been investigated. Again working upon rats, Evans came to the conclusion that E has a marked beneficial effect upon growth, and this effect was not due to any indirect action through the sex glands but was obtained after their removal. The growth was produced by carefully purified, sterol free fractions of wheat germ oil. These fractions could not contain either A or D.

Karl Mason, to whose work reference has previously been made, stated that vitamin E alone is not responsible for the growth observed. There appears to be some other unknown factor which is responsible, and which is not any of the known vitamins. It was suggested that E might resemble B in consisting of several factors, a growth-promoting and a sterility-preventing one.

It can be said, then, regarding this vitamin, that our knowledge at present would lead us to conclude that it has definite effects on at least one species of animal. In the male rat absence of E causes degeneration of the testis; the female's sexual organs are not obviously impaired but gestation is rendered abortive. The view that this was due to faulty iron metabolism is now untenable. The relation of this vitamin to growth is indefinite but it seems reasonable to expect some connection between healthy growth and fertility.

We have attempted only a very brief review of this most popular subject. It is very obvious that the vitamins are rapidly assuming an important place in preventive and curative medicine. Many Canadian practitioners are able to make certain that the diet of their patients includes all the vitamins, but more exact information on the appropriate dosage of these substances and their distribution in Canadian foods is needed.

Periodic health examinations should provide an excellent opportunity for the physician to detect vitamin deficiency or other defects in the diet of apparently healthy people.

VITAMIN CONTENT OF HONEY — The experiments recorded in the literature suggests that honey is not a good source of vitamins. Since these tests were made, vitamin research has progressed considerably, and it therefore seemed advisable to test honey by the more refined methods now available. Two representative samples, one a fresh English comb honey and the other a West Indian granular honey, were obtained for the purpose, and tested, and both were found to be deficient in vitamins *A*, B_1, B_2, *C* and *D*. Tables and curves show the results. As shown by other workers, honey is not a source for these vitamins, and this deficiency is not due to deterioration consequent on treatment or storage.— E. Hoyle, *Biochem. J.* **23:** 54, 1929.

Clinical and Laboratory Notes

PYELOGRAPHY FOLLOWING INTRAVENOUS INJECTIONS

BY N. E. BERRY, M.D.

Montreal

The fact that iodides excreted by the kidney could cast a shadow in the renal pelvis was first observed in patients who had been receiving large doses of potassium iodide over long periods. This led to thorium nitrate and the colloidal silver preparations being replaced by sodium iodide as a pyelographic medium when injected through the ureteral catheter. This method has proved so satisfactory and safe that nothing further has been sought for.

It has long occurred to members of our staff, during the routine examinations of kidney skiagrams, that those which happened to be taken following examination of the gall bladder by Graham's method showed uniformly well defined kidney shadows, always better than those obtained in the usual skiagram. It seemed therefore that some such intravenous injection might be of use as an additional aid in certain cases where an accurately defined kidney shadow is imperative, and that, incidentally, the renal pelvis might be visualized.

We have attempted to follow out this idea in our department of urology at the Royal Victoria Hospital. Sodium iodide was chosen as the opaque medium and it has been tried in various ways. It has been used alone and in conjunction with other preparations designed to produce increased excretion with concentration of the iodide in renal tissue and pelvis.

We have carried out the experimental work on rabbits in order to determine the toxicity of our preparations and whether or not they can be excreted in sufficient concentration to cast a shadow in the x-ray. We have found that a simple mixture of sodium iodide and urea may be tolerated in enormous doses, provided that the urea is in excess. For example, a rabbit weighing 1 kilo may easily tolerate 2 grams of iodide and a like amount of urea. The rabbit's renal pelvis is, however, so small that it cannot be visualized even by this amount of iodide, and even if the ureter be ligated. The bladder, however, may readily be outlined, following injections of much smaller amounts of iodide, and when it does not contain more than 10 c.c. of fluid. As a human renal pelvis will often contain this amount we feel that the method may be practicable. We have in the course of preparation a new compound with which we hope to be able to carry this out in actual clinical cases.

Work along similar lines has been done in Germany, and an account of one of the initial reports by A. Roseno will be found in the abstract section of this *Journal*. It has also been taken up by A. von Lichtenburg, whose clinic at St. Hedwig's Hospital in Berlin is undoubtedly one of the finest in Europe. He and his associates confirm the practicability of the method. They use an iodide compound which has been worked out by Professors Binz and Räth, of the Chemical Institute of the Landwirtschaftliche Hochschule in Berlin, and is now manufactured by the firm of Schering-Kahlbaum. The distribution however is still in the hands of the originators and it has not yet appeared as a commercial product. A small amount is now being received by the American Urological Association for distribution among approved clinics, and we expect soon to have the opportunity to compare this with our own method.

To what extent this procedure might replace existing methods, even if it comes up to the best expectations, is still indeed problematical. Modern pyelography is at once one of the simplest, safest, and most accurate methods of diagnosis known to medical science. It can be done as easily and with as little discomfort as an intravenous injection, and without the necessity of introducing any foreign material into the general circulation. Reactions of any sort following pyelography as now practised are very exceptional indeed, and when they do occur may be traced practically always to an error which the astute observer rarely makes. While the intravenous method offers us an index as to the relative and absolute functional capacity of the kidneys as well as to the emptying time of the renal pelves, we do not feel that as a routine procedure this information would be nearly so valuable as that afforded by the examination of separate specimens of urine, as obtained by ureteral catheter, and the cystoscopic appearance which is often of utmost diagnostic significance.

The indications for the use of this method are specified by Von Lichtenberg and Swick as follows: "Cases where anatomical, pathological or technological considerations make it impossible to use cystoscopy, ureteral catheterization, or direct pyelography; furthermore in cases of ureteral stricture and in cases where pyelography entails dangers for the patient."

Whatever the future holds for this new method, time alone can tell. It will never entirely replace our excellent methods of direct pyelography now in use. It may, however, be of definite assistance in certain difficult cases where one must employ everything that affords any additional information, particularly as to the accurate definition of kidney shadows. It is indeed to these difficult cases that our efforts are directed in the perfection of any diagnostic procedure.

Editorial

PERIODIC HEALTH EXAMINATIONS IN CANADA

DURING the last half century achievements in public health work throughout the world have been an outstanding feature of medical progress. To-day, if we except influenza, pneumonia, and anterior poliomyelitis, we may say that modern medicine has solved the problems underlying public health. Interest, of course, is still at fever heat in "rounding up" the three outlaws mentioned above. These advances were made possible in almost all instances by men who were devoting their lives to research work.

It is but natural that interest should now be turning to the personal health of the community. Industrial organizations have long recognized the wisdom of regular inspection of their machinery and material equipment and, reasoning by analogy, have commenced regular health examinations of their executives and workers. For some years, the Metropolitan Life Insurance Company and the Life Extension Institute of New York have been at work in this field. To-day, the value of periodic health examinations is enthusiastically confirmed by the medical profession and by leaders amongst the laity.

This work must, of necessity, be done by the family physician, if it is to be a factor in national health. As Jenner developed vaccination in his own practice, and as Sir James MacKenzie advanced the knowledge of heart affections, so too we may well find that, through periodic health examinations, the family physician of to-day may discover many signs which precede the symptoms of illness. The value to the nation of careful medical health advice on habits of rest and work, on problems of diet and growth, on infections from within the system as a factor in premature age and decline, as associated with degenerative changes in the cardiac, hepatic, renal, and nervous systems, can scarcely be overestimated.

The Canadian Medical Association has been at work on this problem for several years. To-day, under its auspices, a demonstration of the value of periodic health examinations is under way in Canada, a demonstration made possible by the co-operation and financial support of the Sun Life Assurance Company, the Canada Life Insurance Company, the Confederation Life Insurance Company, the Equitable Life Insurance Company of Ontario, the London Life Insurance Company, and the Manufacturers' Life Insurance Company. These companies are extending to policy holders of $10,000 and upwards, who are forty years of age or over, the privilege of a free, annual, medical examination. Each company offers this examination to its policy holders in a personal letter which explains that this examination will be confidential between him and the physician of his choice. A card is enclosed on which the policy holder notifies the Canadian Medical Association of the name of the physician whom he desires. This physician is notified by the Canadian Medical Association, and he makes the examination at his office in the usual way. He, in turn, advises the Canadian Medical Association that he has made the examination, states the time spent in conducting it, and answers "yes" or "no" to the following question, "Did you find any condition which by way of advice or treatment was worthy of correction?" On receipt of this voucher, the physician is paid $4.00 for the examination by the Canadian Medical Association. The insurance company, sponsoring the examination, then pays the Canadian Medical Association the sum of $6.00. The $2.00 retained by the Canadian Medical Association covers the cost of printing, supervisors, and direction.

That the interests of the insurance company and the policy holder are initial is obvious, and yet the Canadian insurance companies have made it clear to all that primarily, on their part, this is a gesture in personal health. To ensure its success, they have handed over the direction of the whole

campaign to the Canadian Medical Association. They do not insist on any particular form of examination record. They do not ask for any extensive report for statistical purposes. They will write each policy holder some time after his examination, and ask him if the examination was satisfactory to him or if he has benefited from the advice given. They will watch in their death claim reports for contributing causes of death which have or have not been noted in previous periodic health appraisals. They look for an increased national health consciousness on the part of the laity. They will have, undoubtedly, the hearty, intelligent co-operation of the medical profession throughout Canada. On the latter point, one can speak with assurance.

At the annual meeting of the Canadian Medical Association in Montreal in June 1929, Dr. Charles F. Martin, Dean of the Medical Faculty of McGill University, showed, for the first time. the motion picture film which had been prepared giving each detail of the physical examination required for this work. Later, this film was shown from Halifax to Vancouver as part of the post-graduate instruction conducted by the Canadian Medical Association each year.

In co-operation with the Canadian Medical Association, the Department of Health, Canada, issued a manual for the guidance of physicians in making periodic health examinations. A record form containing a reasonably full history and a complete physical examination form are included. Further, the booklet contains very valuable suggestions on health counsel, on diet, exercise, and mental hygiene.

For years, the medical profession has aspired to direct such a health movement as this. In 1881, Dr. William Canniff, of Toronto, in his presidential address to the Canadian Medical Association, spoke as follows:—

"Let it become the function of the physician not merely to cure disease but to prevent it. By periodical visiting, the physician can give such advice and instruction relating to personal, house, school and, I may say, business hygiene as will prevent no little sickness."

The Insurance Companies of Canada have accepted this challenge. Each member of the medical profession in Canada, whether actually undertaking the examination work or not, can aid in this forward movement. The medical profession and the medical profession alone can make it a success.

H. H. MURPHY.

LOOKING INTO THE GLOOM

DOLEFUL misgivings relative to the future of medical practice have had frequent expression of late. There is evidence in plenty that special practice offers a lure which many fail to resist. There is further evidence that a large number of medical students are not mastered by a mighty desire to involve themselves in the labours, responsibilities, and privations of the country practice which has been the making of so many of the great practitioners of the past. And some hold the devastating fear that residents of country districts are soon to be quite deprived of doctors, while the city dweller is destined to the equally dismal fate of having no one to resort to but an eminent specialist when even a trifling ailment overtakes him—a theme, indeed, for a very terrifying picture by a thorough-going futurist.

Signs of unrest are reported from various quarters. Magazine writers, some of them members of our profession, depict the distress of the man of moderate means who is called upon to pay the enormous bills occasioned by the serious illness of a member of his family. Such a man may be obliged to live in a small flat, for which an immoderate rental must be paid, and the bills for dress, food and gasoline are very high, and when the doctor is called he wants the patient to go to hospital. A nurse is needed, and there is no room for her in the flat, so the doctor gets his way. Something must be mortgaged. If the doctor were a country practitioner he would manage with home treatment and home nursing, and the chance for recovery would be almost as good. So it is quite clear that the doctor is responsible for the whole situation.

It is not easy for the public to understand why such changes have come in the methods of the physician. It is dimly realized that some diseases are being dealt with more successfully than formerly, but this is as likely to be attributed to happy intuition or lucky empiricism as to scientific investigation. On the other hand, there is, in the popular estimation, quite as much sickness to-day as at any past time. It is pleasanter to blame this on the doctor than on the makers of ease, comfort, and earthly joy, whose exploitation of the public is accepted as cheerfully as if it were a heaven-sent blessing. Even if physicians are more scientific than they were, why should that increase the cost of medical care? Is it not the boast of science that it has so reduced the cost of production that what were formerly luxuries of the rich are now easily available to the poor? Moreover, *nota bene*, the medical profession is heedless of these protestations, and seemingly is going to insist on having its own sweet way, except in so far as it comes under the control of the capitalists, whose benefactions to medical schools cannot be for other than sinister purposes. Why, then, should this stubborn profession not be taken firmly in hand and brought under public control?

It is not long since military medical organization demonstrated hitherto undreamed possibilities in the prevention of disease. So deep was the impression upon the public that the wish was widely expressed that military medical methods might be made applicable to civilian life. Some enthusiasts, medical men included, even plumped for state medicine, and several members of the profession outlined schemes which were not devoid of alluring features. But the profession as a whole were unconvinced, and both lay and professional advocates wearied, so the adoption of such a scheme does not appear to be imminent.

In some countries state systems of sickness insurance have been in effect for several years. Those of us who have read the journals for a quarter-century or so know that the objections of the profession to the scheme which Mr. Lloyd George succeeded in passing through the British House of Commons have not been quite removed, and that there is still dissatisfaction in medical circles of the Motherland. It is true that there has not been a mad rush on the part of countries generally to become aligned with those countries which have adopted state insurance. There has been much talk about it, and in some of our Canadian provinces it is still being discussed, but the delay in reaching decision would suggest that governments are considering more than means of financing the scheme. It should not be forgotten, however, that in a threatened political crisis, a strong *vox populi* sometimes appears to be a veritable *vox Dei*. And the *vox populi* has, on many occasions, developed strength with astounding rapidity. Nor should it be forgotten that, while the wind does not blow all the time, when it does blow it bloweth where it listeth, and one cannot tell whence it cometh and whither it goeth. The proverbial straw does not always give precise information. We know, however, that friction causes heat to be produced, and heat is an essential to the production of wind, and a vigorous wind may cause serious disaster. Because of such things it is suggested that there are excellent reasons for taking precautions against friction.

There can be little doubt that many of the laity do not understand the aims and ideals of medicine. Perhaps we have been too reticent about informing the public of our accomplishments. Seemingly the public is interested in matters which concern health, else the "health talks" presented by the newspapers would be discarded as unceremoniously as syndicated matter usually is if it fails to meet with approval. Carefully prepared articles for the press, descriptive of the methods and aims of medical teaching and medical research, of the means by which our great triumphs have been achieved, and of the reasons for the recent changes in the methods of practice, should be at least as welcome to intelligent readers as the advocacy of starvation or orange juice diets. Opportunity might be taken to show that responsibility for the "craze for hospitalization" does not lie wholly with the profession. A frank exposition of the situation of the profession should be helpful in bringing about a better understanding on the part of the laity.

Perhaps, too, we should endeavour to

stem the tide towards specialism—a tide which does not always sweep on to fortune. There is a disposition to blame the schools for not directing more men into general practice and into country districts. Many a student enters the school with a specialty in view because he has been so advised by his family doctor. The fault does not lie wholly with the schools, and if members of the profession were unanimous in advising intending students to plan at least several years in general practice before giving consideration to a specialty, advantage would doubtless result to both students and the public. This may be unnecessary, in view of the natural tendency to come to balance. For we are told by the Commission on Medical Education that "specialism has probably been developed beyond the actual needs of individuals and the community."

A glance into the gloom does not disclose so accurate a picture as a long look. All of the laity are not pessimists, and many appreciate the good features of present day medical practice. If there be danger ahead, it probably lies within rather than without our ranks, and it is quite likely that it can be warded off by very simple means. And it is a principle with us to give simple means the first trial.

W. H. HATTIE.

MODERN METHODS IN THE TREATMENT OF DIABETES

THE report of the Department of Metabolism of the Montreal General Hospital for the year 1929* suggests interesting comparisons with conditions before the establishment of this department in the hospital less than ten years ago.

First of all, there has been a great increase in the number of diabetic patients admitted to the hospital for treatment. In 1929 the diabetic patients numbered 223, whereas in five years from 1916 to 1920 there were only 111. This observation is in keeping with the generally observed fact that diabetes is on the increase.

But, along with this increase in the incidence of the disease there is another equally well established fact, which also is exemplified in this report, and that is a striking fall in the mortality rate from diabetes itself. The number of deaths in the group for 1929 was 11, that is, a mortality of less than five per cent. The number of deaths amongst the 1916-1920 group was 15, a mortality rate of slightly less than 15 per cent.

When these figures are analysed the following differences in their composition are apparent.

DEATHS IN 1929 GROUP

Septicæmia	1
Carcinoma of the stomach	1
Carcinoma of the lung	1
Cerebral thrombosis	3
Myocarditis	2
Pulmonary tuberculosis	2
Pulmonary embolism	1

DEATHS IN 1916-1920 GROUP

Coma	7
Pulmonary tuberculosis	4
Gangrene of the foot	1
Cellulitis	1
Myocarditis	2
Pneumonia	1

One learns from this report that other outstanding improvements have been made in the treatment of diabetics, such, for instance, as the successful performance of many major operations during the course of the disease whilst previously they were undertaken with reluctance on account of the attendant high mortality. But it is the abolition of coma as a cause of death amongst diabetics which is such a striking feature. Diabetes still claims its victims, but since the days of insulin it has become less and less frequent for that claim to be enforced by coma. Now, it is possible to say that no diabetic should die of coma in a well organized hospital.

Insulin is one of those great developments in medicine which lies across the century like a line, so that one says "before insulin" as one says "before Lister," or "before Harvey." But our mastery of diabetes is still only relatively complete, as indeed is our mastery of sepsis, or our understanding of the vascular system. It is to be attained only by organized, painstaking effort, such as is now showing its fruit in this report from the Montreal General Hospital.

H.E.M.

* Annual Report of the Montreal General Hospital, 1929.

SOME RECENT RESEARCHES ON PSITTACOSIS

THAT curious disease, psittacosis, continues to occupy the stage, and is affording an excellent opportunity for study and speculation. As has happened before, in the case of other infective diseases, so here, fuller research has served to show the inadequacy of the commonly accepted view as to its etiology. In fact, every notion pertaining to the disease has recently been under revision. The result is that where once there was certainty, now there is only probability. For instance, Nocard's *B. psittacosis*, as the specific cause, bids fair to pass into the discard. But what microorganism is to take its place? Some other member of the salmonella group, or a filterable virus? The question has even been raised whether there is justification for speaking of a specific disease, psittacosis. The specific cause, if there be one, is not as yet absolutely determined. What is the relationship of human psittacosis, so-called, to parrots? Is the human form of the disease traceable to parrots, or is the parrot form traceable to human beings? Or, again, is the association between human beings and parrots merely coincidence, remarkable indeed, but still fortuitous? We await the answers to these questions.

In the absence of complete proof that there is a specific microorganism common to the human and parrot forms of psittacosis the relationship of man to bird in this particular must be in debate. Yet, the circumstantial evidence in favour of some relationship is strong, leaving, in fact, but little room for serious doubt.

The etiological importance of *B. psittacosis* (Nocard), now regarded as identical with *B. aertrycke* and *Salmonella* (Mutton), is at present very much discounted. In the case of an epidemic among birds at the London Zoo in 1920 Dr. H. Marrian Perry[1] showed that the organism known as *B. psittacosis* was responsible for the infection, and he was able to prove the identity of this organism with the commonest type of *B. aertrycke* associated with human cases of food poisoning. Nevertheless, in none of the human cases met with recently in England and Germany, and carefully studied, was *B. psittacosis* or other member of the salmonella group isolated, either from the human cases or the birds incriminated. The nearest approach to it seems to be in the isolation of an organism identical with *B. psittacosis* from the cage of a parrot apparently responsible for three cases of human psittacosis, out of a series of twenty-one, reported by Dr. A. P. Thomson[2], of the General Hospital, Birmingham. The pathogenicity of this form was still under consideration at the time of writing. Similarly, in Germany, in some thirty-four cases studied[3,4,5] bacteriological examinations afforded no data of etiological significance. Hegler thinks that the disease may be due to a filterable virus acting, perhaps, in combination with other microorganisms, such as pneumococci and streptococci, which happen to be present. The theory of a filterable virus was advanced as long ago as 1906 by Stuzzi, who thought that psittacosis was none other than fowl plague, a disease not uncommon among domestic poultry. Elkeles, one of the German investigators, also is of the opinion that *B. psittacosis* has nothing to do with the disease.

It is generally stated now that psittacosis, clinically speaking, has many of the features of a paratyphoid infection combined with an unusual and peculiar type of pneumonia. The morbid anatomist, also, has found the character of the pneumonic lesion to be remarkable. To quote Prof. G. Haswell Wilson, who performed an autopsy on one of Dr. Thomson's cases;—"The changes in the lung are those of a pneumonia of unusual type and do not resemble those found in lobar pneumonia, in ordinary broncho-pneumonia, or in septic pneumonia complicating a septicæmia due to infection by any of the pyogenic organisms." Perhaps we may have here a differential point of much importance. Incidentally, and by way of adding to the

1. PERRY, H. M., *Brit. J. Exper. Path.* **1**: June 1920.

2. THOMSON, A. P., *The Lancet* **1**: 396, Feb. 22, 1930.

3. HEGLER, C., *Deut. med. Wchnschr.* p. 148, Jan. 24, 1930.

4. EMBDEN, H., AND ADAMY, G., *Münch. med. Wchnschr.* p. 140, Jan. 24, 1930.

5. ELKELES, G., *Münch. med. Wchnschr.* p. 139, Jan. 24, 1930.

confusion, it may be stated that Prof. C. J. Lewis and Dr. W. T. Hiller isolated from the lungs and spleen in this case a bacillus resembling *B. faecalis alkaligenes* and another non-lactose fermenting bacillus which may prove to be pathogenic. Or, as Dr. Thomson suggests, it may be a secondary invader.

The most convincing experimental evidence as to the etiological agent in psittacosis is that presented by Bedson, Western, and Simpson,[6,7] working in the London Hospital. They have reported the isolation of a filterable virus from a parrot that had died from psittacosis and during life had been responsible for two cases of the disease in man. In their second published paper they state that they have recovered a filterable virus from three parrots, investigated from this standpoint, which had caused human cases of the disease. In each case the filtrate of an organ suspension has produced a fatal disease in budgerigars, and one of these strains has been carried through to the third generation in budgerigars, filtered material being used throughout. In the case of one out of six parrots, investigated because they were ill, but which had not been responsible for disease in man, *B. aertrycke* was isolated. In this connection these authors remarks—"This parrot is of particular interest, for the post-mortem picture it presented was so different from what had been observed in the other parrots, including the three from which we have obtained a filterable virus, that even the most uninstructed and casual observer could not have failed to note the difference. During life there was nothing in the appearance or the symptoms of this bird which distinguished it from those suffering from psittacosis; further, in this particular bird *B. aertrycke* was isolated from the heart blood, liver, spleen, pericardial fluid, and intestinal contents with the greatest ease. We feel that this observation is additional evidence that *B. aertrycke* is not the etiological agent of psittacosis." Furthermore, these observers have inoculated budgerigars with material from eight human cases and in every instance have produced disease in these birds. Control birds, inoculated with normal human blood, were not affected. From two of the budgerigars they were able to pass the disease with filtrates of a suspension of liver and intestine, thus carrying the investigation of the two human strains a stage farther. They conclude;—"Although we have no proof as yet that the parrot and human strains of virus we have isolated are the same, there can be little doubt that they are; the final proof of this will be a matter of farther study." Like the other observers mentioned, Drs. Bedson, Western, and Simpson are unable to incriminate members of the salmonella group. The relationship of their virus to fowl plague is still undetermined.

A sufficient number of cases have been recorded to enable us to establish with considerable precision the clinical features of the disease called psittacosis. The following points are taken from Dr. A. P. Thomson's very excellent study in *The Lancet* (*loc. cit.*). There are certain resemblances to typical typhoid fever in the severer cases. The pulse is relatively slow, despite a high continuous fever. In some cases leucopenia has been noted. Headache is intense, generally occipital, and often associated with slight cervical rigidity. Diarrhœa and vomiting sometimes occur in the early period. But there are many differences. The onset is usually more abrupt than in typhoid fever, and the temperature rises more rapidly. Sweating may be severe. Epistaxis occurs but is not common. The spleen is not usually palpable, and rose spots are not observed. As a rule the gastro-intestinal features are not obtrusive. In one of Dr. Thomson's cases a typhoid-like relapse occurred. The most notable feature of the disease, however, is the involvement of the lungs, and involvement, too, of a peculiar character. The signs are, at first, those of a shifting bronchitis, followed in a few days by those of extensive consolidation, manifested by impairment of the percussion note and the appearance of tubular breath sounds. Later, the percussion note becomes absolutely flat and the breath sounds in the affected area disappear. This curious silence of the lung may persist for some days after the temperature has fallen and the general condition has improved. A whole lung may be involved in this fashion. Resolution sets in very rapidly and is quickly completed.

6. BEDSON, S. P., WESTERN, G. T., AND SIMPSON, S. L., *The Lancet* **1**: 233, Feb. 1, 1930.
7. *Ibid.*, *The Lancet* **1**: 345, Feb. 15, 1930.

The flatness over the lung of course suggests the presence of fluid, but repeated explorations of the chest have never revealed any. Dr. Thomson concludes that these peculiar features are due to occlusion of the smaller bronchi, and this view was confirmed by the autopsy findings in one of the cases.

Other features are noteworthy. Although cough is frequent and at times incessant, it is never painful. Expectoration is scanty, frequently absent, rarely rusty. Respiration is not hurried unless the area of lung involved is very extensive; it is easy and never like that in pneumonia. Pleuritic friction was found only once.

Certain nervous manifestations, found in several of Dr. Thomson's series, seem to be important, namely, a peculiar impassiveness of the face, with absolute lack of movement of the body, features suggesting parkinsonism.

A.G.N.

POLLUTION OF THE AIR

DURING the past year or two, it is gratifying to observe a renewed and determined effort to lessen the amount of air pollution. The problem, of course, is not a new one. Some fifteen or twenty years ago the Mellon Institute of Pittsburg, Pa., sponsored the first broad scientific study of smoke abatement. After sufficient data had been collected, legislation was obtained, designed to lessen the nuisance from smoke. This legislation served as a basis for smoke abatement laws in other cities of the United States and even in Europe, particularly in England. At that time smoke was the only factor dealt with, and the harmful effects of various gases and solids, other than carbon, in the air were not considered. Subsequently, in 1923 and 1924 the Institute made a supplementary survey to determine the effect of the Pittsburg ordinance on the degree of atmospheric pollution. It was found that there had been an approximate decrease in smoke, of seventy per cent, but an increase of forty per cent in total solids. Recently, the Institute has taken up the problem again, in the hope of arousing public interest in the evils of air pollution and, also, of developing effective and economically feasible measures for relief.

In England the Smoke Abatement League of Great Britain has been active in eliciting public interest and the co-operation of municipal and other public bodies in the question, and the Department of Scientific and Industrial Research, with various governmental bureaus, is studying the many scientific and industrial problems involved. At the present time no less than forty of the local authorities are co-operating with the other bodies. All this is promising for the future.

While many of the larger cities have adopted anti-smoke ordinances, it is obvious that, with the growth of industry, the nuisance does not tend to become any less and that the measures taken to curb it are far from sufficient. The measures so far adopted have mainly been directed towards lessening what is popularly called "smoke," that is, suspended carbon, or soot, in the air. Little or no attention, until recently, had been directed to the other constituents of "smoke," the gases and non-carbonaceous solids, which are probably even more injurious to health than the carbon. It is not to be forgotten, furthermore, that besides "smoke" the air is seriously contaminated by other forms of suspended matter, dust of many kinds, stirred up by every wind that blows. Some idea of the menace that dust means may be gathered from a laboratory determination of the amount of suspended matter in the air of Rochester, N.Y. During the period from November 11 to 14, 1929, an average of 0.207 tons of dirt fell daily per square mile. Prof. Lalean, the well-known health authority, speaking in Edinburgh recently, estimated that the forty pounds of air respired daily by the average person might contain 285,000,000 particles of dust, soot, tar, and acids, in times of smoke and fog.

Investigation of the material deposited by smoke shows it to consist partly of carbon, and partly of carbon monoxide, sulphurous oxides, phenols, tar products, and

acids. Chimney effluvia, free from smoke, also contain acids.

The elimination or diminution in the amount of soot in smoke, while not solving the whole problem, would go far to lessen the menace to health, for several reasons. Soot does much to obstruct the free access to the earth of the sun's rays, including the valuable infra-violet rays. It has been found that in large cities fogs increase in proportion to the amount of coal consumed and that the harmful elements in the air thereby become concentrated. Town fogs, unlike country fogs, are harmful to vegetation and even to metal work and certain kinds of stone used in building. Furthermore, as much as nine per cent of sulphuric acid and seven per cent of hydrochloric acid have been found in soot. Apparently, the acids that would ordinarily escape into the air tend to condense on the solid particles of carbon, which as they fall gradually reach the lower stratum of air used for respiration.

The menace from smoke is a twofold one —economic and hygienic.

Smoke is not confined to the streets. It penetrates into our stores and dwellings. Delicate fabrics are to some extent damaged by it and many articles require washing frequently, to their detriment. This demands water, soap, and an increased expenditure of time, energy, and money. Then, again, vegetation may be stunted and buildings damaged where the air is highly charged with corrosives. Financially speaking, smoke and dirt mean a dead loss. To quote Professor Lalean again;—The total loss in Great Britain due to smoke is £40,000,000 annually, of which £32,000,000 could be saved without harm to industry.

Medical men will readily agree that a smoke-laden atmosphere is detrimental to health, yet it may be difficult to be specific in the matter. An excess of carbon in the air undoubtedly greatly diminishes the amount of sun's rays reaching the earth, an important matter. Fortunately the cult of the Sun has been revived lately and its devotees are increasing daily. Some at least can get to the pure air of the country or seaside. Perhaps the movement will spread. A smoky, dusty, atmosphere brings about catarrhs of the respiratory tract and, not improbably, may delay convalescence from respiratory and other disorders.

Suspended carbon, otherwise "soot," is probably not particularly harmful in itself. It is a mild irritant and pathologists are familiar with the practically universal condition of the lung known as anthracosis, in which, even with an extensive deposit of soot, the texture of the lung is singularly little damaged. The case is not the same, however, with deposits of other kinds of dust, such as, stone, silica, iron, asbestos, tar, and asphalt, which, driven about by the wind, are easily inhaled and may cause serious pathological change.

Carbon monoxide is a deadly constituent of the air, when in concentration, as the numerous deaths of motorists in closed garages amply testify. Even in small amounts the gas has been shown to be harmful to the general health.

Possibly, and not improbably, the presence of acids and tar products, and other irritating substances in the respired air may be responsible for the undoubted increase in pulmonary cancer.

The problem, as will be gathered, is a big one. It will only be solved by attacking it systematically and in a broad way. Already methods have been devised for destroying noxious vapours emanating from power plants, and, in England at least, are being put into operation. Also, several types of smokeless fuels are on the market, which give better results than ordinary soft coal, though they cost more. Much, in this matter, can be done by publicity, for the public are quickly becoming awakened to health questions. Then, the co-operation of governments, municipal and other local bodies, of health officers and committees, must be enlisted. Finally, the problem must be attacked scientifically by observation and experiment, so that those in authority, who are in a position to act, may have at their disposal a body of unassailable facts. This may take time, but it will be done.

A.G.N.

THE TREATMENT OF THE DRUG ADDICT

THE treatment of the drug addict, under existing conditions, is accompanied by many real difficulties, the removal of which must ultimately depend upon the provision of adequate hospital facilities. While special institutions should be our objective, much can be done in our general hospitals to relieve these unfortunates of their habit. The actual treatment itself is simple, easily carried out, and, in the absence of complicating physical disabilities, successful.

The fairly rapid withdrawal, under such a régime as the Lambert and Towne or hyoscine methods, is on the whole the most economical and most humane. Excepting the several days following the treatment, when the withdrawal symptoms are at their worst—though even then they are easy of control—the patient's discomfort is not great, comparatively. For the several weeks following complete withdrawal, which is all our present hospital facilities can provide for recuperative purposes, the patient is comfortable, active, and indeed happy. The real difficulty arises after discharge; and, indeed, it is the prospect of this period, with its resumption of former activities, its necessary meeting of old confederates, and its alluring suggestions, that haunts the patient during his period of recuperation. One feels keenly the necessity for the co-operation of government and social agencies in supporting the morale of the patient for months and years after his re-establishment as a self-respecting member of society. To this end, it is not infrequently necessary to consider the transference of the patient to another community where new friends and associations may more easily be made. This has proved effectual in several cases dealt with by the writer, but, of course, can only be carried out under specially suitable circumstances. The provision of these circumstances might be facilitated under government and social supervision.

While, then, institutional care is the first essential, the continued supervision and moral support of the patient by recognized governmental machinery is a necessary means to his complete re-establishment in law-abiding community life. It is hardly necessary to state that any attempt at treatment outside a hospital, or while the patient is carrying on his accustomed contacts with society, is foredoomed to failure. There is no such thing as ambulatory treatment, and the idea should be dropped from all serious study of this subject. FRED. H. MACKAY.

Editorial Comments

HEALTH INSURANCE

We have pleasure in republishing the following editorial reflections which appeared in the *Bulletin of the Vancouver Medical Association*, March, 1930.—[ED.]

"An account of the interim report on Health Insurance by an appointed committee of the local Legislature has recently appeared in the press. Doctors will be interested, for the medical profession has discussed this question in considerable detail for many years. There must be a mass of information, accumulated in the archives of the medical associations, having a bearing on this subject.

Health insurance at the present time probably means an extension to medical cases and to surgical cases, for that matter, of benefits something on the lines at present granted to industrial accidents through the Workmen's Compensation Board. It will of course be a much more complicated affair to work out, as to be really effective the insurance must embrace periods of unemployment. Most countries having such arrangements have adopted something in the form of the panel system which provides benefits for all people whose normal earnings do not reach a given standard, presumably whether employed or not. Such a system, one would think, should be nation-wide in its application.

The panel system has this disadvantage, as far as the medical profession is concerned, in that it interferes in part with the principle the profession has always maintained, that is the right of the patient to a free choice of doctors. To an extent the choice is free, free among those doctors who agree to do panel work and free in the sense that a change of doctors can be made once every year if the individual so desires. We believe that somehow or other better work is accomplished when there is a minimum of inter-

ference with the personal relations of patient and physician. Such a relationship has its drawbacks, it may be at times abused, but on the whole we are satisfied that it works out to the best interests of the community.

The experience of the Workmen's Compensation Board should be invaluable in helping to solve this problem of health insurance. Here the principle of free choice is for the most part fully at work and for the most part too, we may believe it has proven satisfactory.

The doctors under such a system have very distinct obligations, not only as to the quality of their work, not only as to their ability to undertake such work, but as to their ability to press cases to an early convalescence and to a consequent reduction in the expense entailed on the contributing parties.

We see difficulties in health insurance with regard to laboratory and x-ray work. Curtailment of these services is the last thing to be sought. Cost reduction, so that fuller and freer use of these invaluable adjuncts can be made, is the great desideratum. All doctors deplore the cost of these examinations, not necessarily because it depletes the resources of the patient, but because it makes the physician hesitant about some desirable, but not quite obvious, form of investigation.

We gather that the medical profession will see before a great time strange developments. The non-pay patient may even disappear out of our hospital wards. Boards of directors will then sleep easier o' nights and staffs—staffs will be such stuff as dreams are made of. Well, we have brought things on ourselves, we have been so busy discovering and inventing and prying hither and thither and producing cures and alleviations which have been heralded to the corners of the earth and preventions, that but for the resources of nature, we should before this have made the world safe for democracy and everybody else.

Now people are waking up and demanding a greater share of these good things, finding life so desirable as to demand an indefinite extension. It is up to the doctors to provide it, preferably for nothing, but in any event for wages that will not induce them to retire too soon."

POST-VACCINAL ENCEPHALITIS

The rare complication of vaccinia, encephalitis, continues to puzzle research workers and is likely to do so for some time to come. It is unfortunate that a condition of such gravity, for about 50 per cent of the cases end fatally, should appear, as it were, *de novo* and over a wide expanse of territory at a time when existing cases of small-pox are of mild type. It is difficult to insist upon compulsory vaccination, under the circumstances, when public opinion, lacking the spur of a serious epidemic, is apt to be lukewarm on the matter and an additional handle has been given to the anti-vaccinationist cranks which they have not been slow to use. It is hardly necessary to remark that the value of Jennerian vaccination as a preventative of small-pox is as firmly established as ever. At the present time there is much theorizing about encephalitis and but little demonstrated fact.

There are several possibilities. The vaccinia virus may be the offending agent; the vaccinia virus, when introduced into the body by scarification, may excite into action another organism which was previously latent; the first action of vaccinia virus may be to sensitize nervous tissue, after which an allergic reaction occurs, akin to "shock", which ushers in the encephalitis process; or, there may be a synergistic action between the vaccinia virus and another filterable virus.

The difficulty at present seems to be to obtain sufficient cases for study. A.G.N.

THE POST-GRADUATE COURSE IN INTERNAL MEDICINE OF THE UNIVERSITY OF TORONTO

The progress in Medicine in the last few years has made it necessary for the modern physician to devote a considerable amount of his leisure to study. The need for this has been well appreciated by the Canadian physician and in some degree has been met by the inauguration of local societies, by "clinical weeks" and lecture series, and not least by the provision of speakers by the Canadian and Provincial Medical Associations, aided by grants given by the Sun Life Assurance Company.

Nevertheless there is a growing insistent demand for more post-graduate work and at present this is largely met by study abroad, at no inconsiderable expenditure of time and money. To those who have the entree and adequate time foreign study can be most profitable. It is to be greatly feared however that many of the so-called post-graduate courses do not measure up to the standards of the senior year in medicine in our own universities.

The demands of practice limit the time that many physicians can afford to spend away from home and numerous inquiries have been received regarding short intensive courses in particular subjects. The universities have been sympathetic, recognizing the need for instruction, but heavy demands on the faculty for undergraduate instruction have made a solution somewhat difficult.

The year, as noted elsewhere, the Faculty of Medicine of the University of Toronto offers to

a limited number an intensive course of three weeks' duration in the various branches of internal medicine. It is intended that the course shall be practical and directed to the needs of practitioners of experience rather than undergraduates. Lectures, clinics and demonstrations will occupy the mornings. The wards will be open in the afternoon for the examination of patients. It will also be possible to arrange for individual instruction in certain subjects, if desired. It is to be hoped that the success of the course will encourage the establishment of similar courses in other branches of medicine.

E. S. RYERSON

THE LAST RESTING PLACE OF WILLIAM HARVEY

Elsewhere in this issue, under the caption of "Men and Books," will be found a most interesting account of William Harvey's last resting place in Hempstead Church, Essex, written by Dr. Ross Mitchell, of Winnipeg. His article is timely, for a campaign has been started to secure sufficient funds to make some urgently needed repairs to the interesting old building. The story how the remains of the great scientist were removed in the year 1883 from the Harvey vault beneath the church to a more suitable position within the chapel, at the cost of the Royal College of Physicians, is well known. But more remains to be done. In 1882, the tower, owing to the peculiar character of its component stones, collapsed, and has never been replaced. An appeal is now being issued to the medical profession of the British Empire, "in the hope that the sum required to restore the tower may be obtained with as little delay as possible, and so enable a suitable memorial to be raised to the memory of Harvey by those best qualified to appreciate the greatness of his achievements and the service he rendered to humanity."

It is intended that the tower shall be reconstructed out of the old materials, and the estimated cost is £5,700. Upwards of £1,000 have been collected up to the present.

We heartily commend this project to our readers. The memory of William Harvey is one of the great possessions of the English-speaking race. Indeed, he belongs to all peoples and to all time. Let it not be said of this scientifically-minded generation that it hesitated to maintain adequately the shrine that guards the remains of the "Founder of Modern Medicine."

Subscriptions may be sent to Dr. Arnold Stott, 58 Harley St., London, W.1. A.G.N.

DR. J. B. HURRY

Dr. Jamieson Boyd Hurry, of Reading, England, died on February 13, 1930, at the age of seventy-two. Beyond the confines of his own country he is known chiefly through his illuminating concept of "vicious circles." He was a scholarly man, widely read, widely travelled, and of broad interests. In an obituary notice *The Lancet* remarks that "as doctor, archæologist, and botanist he formed an important link of many *circuli virtuosi* which spread far beyond his own acquaintance."

In 1911 he produced the first of his classical monographs, which was entitled "Vicious Circles in Disease." The idea contained therein proved so fruitful that works on vicious circles in neurasthenia, sociology, and poverty soon followed. Dr. Hurry's books attracted much attention abroad, as was shown by the numerous translations which were brought out. The first book appeared in French, Spanish, and Italian, and "Vicious Circles in Poverty" was translated into French, Spanish, Italian, Chinese, and Japanese. Another important work of his was the translation into English of Spiegelberg's Lehrbuch der Geburtshülfe for the New Sydenham Society, 1887.

Dr. Hurry was greatly interested in medical history, and in his retirement published a volume entitled "Imhotep, the Vizier and Physician of King Zoser, and afterwards the Egyptian Deity of Medicine," of which a second enlarged edition appeared in 1928. At the time of his death he was engaged in writing a volume on "Woad," which will shortly be published. A fuller account of Dr. Hurry's character and achievement will be found elsewhere in this issue. A.G.N.

HONOUR FOR DR. H. E. MACDERMOT

Readers of the *Journal* will join with the members of its editorial Board in tendering to Dr. H. E. MacDermot, the Assistant Editor, their hearty congratulations on the great honour that has come to him. For outstanding services to Finnish immigrants at the port of Montreal Dr. MacDermot has been awarded the Knight's Cross of the Order of the White Rose of Finland, the decoration being presented to him recently by the Consul-general of that country. The honour has rarely been bestowed in Canada, and is well deserved. A.G.N.

DR. S. HANFORD MCKEE

We learn with great pleasure that Dr. S. Hanford McKee, of Montreal, has been elected an honorary member of the Chicago Ophthalmological Society, before which he read a paper in January last.

Special Articles

PUERPERAL INFECTIONS

AN EXTRAMURAL LECTURE

BY JAMES R. GOODALL, O.B.E., B.A., M.D., D.Sc.

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It is not the purpose of this lecture to dwell upon the subject of puerperal infection from the text book point of view, but rather to stress the discoveries of the last few years.

Firstly, there are two major concepts of bacteriology which will well repay a clear exposition. These new concepts are drawn from clinical study and not from the laboratory.

Microbes are much like human beings, differing chiefly in that they are unicellular and not multicellular, but reacting to heredity, to food and environment much as human beings do. Heredity, climate, and food determine physical characters in human beings and are no less important factors in microbic life. The truth of this is perhaps best illustrated by reviewing the work of Calmette. He took the tubercle bacillus and by growing it in an unfavourable environment and medium, (composed chiefly of bile, to which the tubercle bacillus does not respond with gusto) produced, after many generations, a growth of tubercle bacilli of great attenuation—in fact they were no longer lethal. They could be injected alive into children and newborn infants to immunize the recipients. According to Calmette, many thousands of inoculations have been done without producing a single case of clinical tuberculosis. And yet, should one of these infants die of some inter-current disease, it is found at autopsy that these attenuated tubercle bacilli had the power of producing typical small tubercles in the tissues of the child. These tubercles never break down, and are merely an expression of a low grade irritation by the attenuated tubercle bacillus in their midst—the pearl in the oyster, as it were.

Now, the point is that microbes attenuated through many generations of unfavourable soil remain attenuated for a very long time, and it requires many transfers from favourable to more favourable soil to restore virulence, as sometimes happens in epidemics. Transfer of these attenuated microbes into a single favourable soil is quite insufficient to restore their virulence, except in a very slight degree, because immunity develops at the same time and inhibits the return of virulence, but transference to several new favourable soils without natural immunity heightens the virulence with each transfer. This concept touches clinical medicine at a thousand points, and especially is it of importance to obstetrics. It can also be stated as a corollary, not without exceptions, that the attenuation of an organism heightens its tenacity in tissues. Expressed in a few words, the foregoing means this. Acute infections beget acute infections, chronic disease begets chronic disease, and chronic infections are the product of attenuated microbes.

Now, the organisms which a woman harbours about herself at all times are attenuated and she is partially immunized to them; they beget chronic or subacute infections only, but new strains from sources other than her immediate environment are frequently productive of very violent infections. It follows, therefore, that obstetrical technique may suffer many breaks during delivery in the home without disastrous results (unless the surgeon introduces a virulent strain by his surgical contacts in practice.) Hospital technique however, cannot be allowed to suffer any breach because the patient is in a new, strange and dangerous microbic environment. Autogenous infections, therefore, are generally mild infections; heterogenous infections are more likely to be very severe ones.

The second clinical bacteriological concept is as follows. Organisms that have grown upon a certain type of tissue have a strong predilection for that same type of tissue whenever metastases occur. This choice of soil and of food is very striking if closely studied. The selective influence of microbes is something which is just beginning to be understood. It is a protoplasmic attribute, and is the basis of specificity in disease. It is a clinical concept. Bacteriologists have been content in the past to give us morphological classification of the microbes, but this gives no information whatever as to their pathogenicity. Even one of the latest developments of bacteriological study, namely, the hæmolysing properties of microbes, has been proved to be one of no value whatever in judging pathogenicity. Microbes that hæmolyse blood can be innocuous to the human body; others that are non-hæmolysing are frequently most dangerous bandits.

Armed with these two clinical concepts we may approach the subject of infection, cervical and puerperal, with much greater hope of ultimately winning through to a better understanding of disease processes, and still greater hope of opposing their progress.

Puerperal infections are divided into four great clinical groups, by their pathology or mode of spread. (1) Local infections; (2) those that spread by the lymphatics; (3) those that spread by the blood vessels (thrombophlebitis); (4) those that spread by continuity of surface.

It is essential that one should understand these groups thoroughly to be able to treat puerperal infection rationally. Let us take them in the above order.

LOCAL INFECTIONS

By local infections is meant attenuated or semi-attenuated microbic invasions in which the infection remains local. In the more attenuated or chronic types (chronicity considered not from the point of view of duration, but interchangeable with attenuity) the infection produces no appreciable systemic effects. In the less attenuated there will be recognizable systemic effects, such as fever and pulse rate increase, and other signs of systemic absorption, such as loss of appetite, neuralgias, anæmia due to hæmolysis, etc. In the more severe types of local infection, time is a factor of the utmost importance for the body to throw up a reactionary zone of defence. In the more attenuated infections the systemic effects may not be at all detectable or, in other cases, only with experience and observation. These mild types are, by great odds, the most common types of infection during the puerperium. One may perhaps appreciate rightly their frequency when it is stated that 80 per cent of puerperal infections present no symptoms. The most of these cases, but not all, will manifest elevation of temperature and increased pulse rate, (objective signs) but a percentage of cases are both symptom-free and sign-free (as indicated on a chart), either throughout the illness or until later developments occur. My contention is that a patient in the puerperal state, to be normal, should be infection-free, and that means, a symptom-free and sign-free puerperium and the absence of remote troublesome sequelæ.

Local infections may invade any surface which has suffered a solution of continuity. This may be the endometrium, or a cervical, vaginal or perineal tear. We know that an infection remains local or spreads, depending upon its virulence and upon the lowered resistance of the tissues that are invaded. Men of experience in obstetrics know that a prophylactic episiotomy heals kindly when the second stage of labour is short but, on the other hand, when the vitality of the tissues is lowered by prolonged pressure symptoms in the second stage, the traumatized tissues do not heal so kindly. Now, if we follow our cases after their departure from the hospital, at the sixth week, we find that eighty per cent of post-partum cases suffer from a chronic endocervicitis. This is the precursor, if neglected, of delayed involution of the uterus, prolonged lochial discharge, leucorrhœa and, later, chronic subinvolution, chronic cervitis, ectropion, cervical polypi, and cancer.

If we follow our cases closely, in the wards, we find that, at times, twenty per cent of the post-partum cases run a low fever throughout the puerperium; that thirty to forty per cent show a low grade fever for more than three consecutive days. By many this is looked upon as physiological, as is the case after an abdominal section, but such is not the case. The puerperal state ought to be temperature free. If any argument were necessary to prove this statement, one has but to mention the other eighty per cent of cases, taken promiscuously, that do not show any temperature. On the contrary, mild infections are more common in the puerperium of multiparæ than of primiparæ. This is not as one should expect. But there is an explanation, and it is found in the easy accessibility of the multiparous genital canal to microbic invasions and the frequency of chronic endocervicitis dating from a previous pregnancy and relighting, owing to the traumation of labour. After a woman is delivered she generally lies supine in her bed. When so placed her vagina is at an angle of about thirty-five degrees with the plane of her bed. She drains up-hill. The vagina, being in the form of an inverted funnel, lies with its large vault filled with lochia that is unable to drain away. After forty-eight hours this lochia contains quite a flora, and the delicate cervical mucosa, traumatized and torn, devitalized and at times necrotic from pressure, lies bathed in this infected fluid. The result is that eighty per cent of parturients had a residue, *i.e.*, a chronic infection of the cervical mucosa. Does not this infected cervix produce symptoms during the first week of the puerperal state? In the vast majority of cases the answer is, decidedly, No! and the reasons are not hard to find. First of all, most of these cases are autogenous infections and, therefore, attenuated. They give rise to a low grade fever and, possibly, a slight pulse elevation, and nearly always a delay in the normal involution. But symptoms are conspicuous by their absence, because a very widespread and severe infection of the cervix, or vagina, or broad ligament can occur without producing pain.

There are only two structures in the pelvis that are supplied with sensory nerves. These are the peritoneum and the perineum (all structures outside the hymen). Between these two surfaces—the peritoneum and the perineum—lies the *pelvic silent area*. Infections in this area, unless they invade the perineum or peritoneum, do not give rise to pain. It will be pointed out later that most of the cases of thrombophlebitis of the uterine veins are silent infections until remote complications arise. Clinicians know that they can transfix and cauterize the cervix without causing any pain. The same applies to the vagina. I have removed portions of vaginal cysts in the last year without local or general anæsthesia, and without pain. Therefore, local infections, if they do not involve the peritoneum or perineum, are apt to be overlooked because they do not produce *immediate* symptoms. But these infections are followed by serious sequelæ, which are all the more frequent owing to their insidious nature. The acute stages slowly and imperceptibly pass into the subacute and chronic stages and remain active over years until serious consequences arise, in the nature of ectropion, (erosions, so-called) polypi, or carcinoma. Slight fever with increased pulse rate and a delayed involution are the only *signs* during the first two weeks; later, prolonged

lochial discharge and copious (though not always) leucorrhœa.

The more severe infections of a pyogenic nature frequently break down and then heal by granulation. These pyogenic infections are usually short lived, and heal spontaneously and completely, but the more attenuated infections are characterized by their tenacity, by producing hypertrophy and hyperfunction of the glands. A duty is imposed upon us as obstetricians to recognize these cervical lesions early in the puerperium, and to adopt, in the first days of the puerperium, posturing of the patients, later cleanliness and heat, such as low-pressure cleansing, hot vaginal douches after the sixth day, and local heat to the pelvis by means of the electric baker or diathermia; also to build up the general resistance of the patient and, later, at the fourth or sixth week, to employ mild cauterization of the cervical canal. This form of treatment will prove both preventive and curative, and will promote the retarded involution of both the uterus and its supporting structures, and prevent many distressing remote sequelæ.

EXTENSION BY THE LYMPHATICS

Usually lymphatic extensions of inflammatory processes are an expression of a more virulent infection. The site of entry may be any genital abrasion or tear. The infection invades the lymphatic system beneath the point of entry and usually extends along the chains of lymphatics, as ordinarily taught. Most of these genital lymphatics, in which we are interested, converge towards one or other broad ligament and from there extend up the sacral and lumbar system. The infection may be compared to an invading army. Its progress may be arrested at any point along its route. The arrest may be permanent, or it may be temporary, under which circumstances it breaks through the defences and advances still further, probably, to be again arrested, permanently or otherwise. If eventually the microbes in large numbers reach the blood stream, where the lymphatics and blood vessels meet, we have a septicæmia or bacteriæmia.

It has been demonstrated of late that the offending microbe, in a larger per cent of lymphatic extensions, is the streptococcus anærdreus, and the reason why it had not been more frequently demonstrated by culture was because anærobic cultures had not been made. Now, the popular and erroneous concept is that streptococcic infections are always virulent infections. This is most fallacious. The streptococcus of puerperal infections is neither virulent nor attenuated, as such. These attributes depend upon the past history of the streptococcus, its origin, its soil, its environment. It can give rise to both the mildest and the wildest infections. The mildest are tenacious and prolonged because they do not produce systemic reaction and immunity. The very mildest infections, by their chronic irritation, produce only deranged function, such as hypersecretion—leucorrhea; others produce hypertrophy, as catarrhal changes, polypi, and ectropion. Others less attenuated extend inwardly along the chain of lymphatics. The development of a phlegmon anywhere along the path of the invaded lymphatic system must be looked upon as salutary in character. It is an expression of local reaction and attempts at arrest. Time, in lymphatic infections, is an essential factor. If time is permitted Nature will avail herself of it, but, unfortunately, in the more severe infections, the extension along the lymphatics is so rapid that the infections reach the blood stream before nature has had time to bring her forces into operation.

Lymphatic infections will be free from pain and symptoms which point to the pelvis as the source, if the peritoneum is not affected. If we watch our lymphatic infections closely we will find that, in the majority of cases, they are free from pain for many days then, suddenly, a severe stabbing pain occurs in one or other lower quadrant. The meaning is clear. The peritoneum has been reached and a localized plastic peritonitis has developed, just as the pleura over a subacutely inflamed lung develops infection. In the acute cases the peritoneum, just as the pleura, is always involved, either along the region of the anterior or posterior, usually the posterior, wall of the broad ligament. The peritoneum is a large lymphatic space and throws out its exudate just as the lymphatics do, as will be pointed out later.

If the infection is of extreme virulence the peritoneal cavity becomes generally infected, owing to the absence of quick reaction. It is interesting to note the differences that the peritoneum presents under different infections. In some cases the peritoneal cavity is filled with free turbid fluid, filled with flocculi of exudate; in others, the fluid is more or less clear; in others there is no free fluid, but the coils of intestine and other intraperitoneal structures are all buttered with an exudate of a creamy colour and consistency. One need not emphasize the futility of attempting to drain such an abdomen. When a local pelvic abscess occurs it is either intraperitoneal or extraperitoneal. The extraperitoneal abscess requires no further comment; its course is that of all lymphatic exudate liquefactions; but an intraperitoneal local abscess in the pouch of Douglas is quite another affair. The peritoneum is a most resistent structure, which can take care of a tremendous amount of infection. Not so, the lymphatic tissues generally. And I cannot conceive of a local pelvic abscess developing secondarily to a broad ligament lymphatic infection except as a pathological process similar to that of the pleura and empyema following pneumonia where it has been proved that the empyema is the result of a small visceral subpleural abscess rupturing into or extending into the pleural cavity. The analogy is so close that I think the inference is warranted. It is a fruitful source of research. The point I want

to emphasize is that the vast majority of lymphatic infections are mild, and as such the peritoneal cavity is not affected, and, therefore, pain is lacking as a determining factor.

Another interesting type of case is that in which the organisms find a port of entry in the pelvis, but invade the blood stream almost immediately, without causing any local symptoms in the pelvis, and without leaving any signs of their passage at the point of entry. These cases are in a class by themselves. One sees them frequently in the wards—true septicæmias, but not very sick patients. Chills are uncommon, high fevers predominate, the pulse is usually not much elevated, and the facies is calm, placid and normal. Yet blood cultures are positive (anærobic streptococci). There is only one inference to be drawn, that streptococci have many varieties and many attributes, and that many of them possess high degrees of pathogenicity and slow dissemination, whereas others have high degrees of dissemination with low pathogenicity, and still other varieties have high degrees of both dissemination and pathogenicity. The first group will be prolific in producing chronic and subacute local pelvic disease. The second group will produce the mild septicæmias without severe systemic disease, and the last group will produce the severe local and systemic infections.

The factor of dissemination of microbes, their power to spread, is one that has not received the attention it merits. It is a factor of the utmost importance in appreciating the mode of spread of infectious disease. Without it a great deal of the utmost importance remains incomprehensible. It is something, a property, remotely akin to diffusion in gases, to convection in fluids and to conductivity in solids. It is comparable to fleetness as distinguished from force.

It was stated earlier that when an organism has manifested a preference to spread by a certain path, it seems to have a predilection for tissues of the same nature or allied nature when it develops metastases. I stated that this amounted to specificity, and was the basis of specific disease. How like the human, this characteristic—patriotism, the attraction of soil, climate, food and environment! The result is that in puerperal sepsis, a lymphatic infection generally develops lymphatic metastases, whereas it will be pointed out later that cases of thrombophlebitides beget remote thrombophlebitides. It is common, therefore, to find that severe pelvic lymphatic infections develop lymphatic deposits in other parts of the body. The chief sites for the development of these metastases are in the legs, as phlegmasia alba dolens, in the neck, arms and back. A short description of such an invasion of the leg will make the process clear.

The lymphatic invasion of the leg usually begins at the groin or upper part of the thigh, though I have seen it begin simultaneously in several parts of the leg. When it begins in the groin or upper thigh the lymphatic invasion may be a direct extension from the pelvic lymphangitis or it may be a true metastasis. The process however is the same. The thigh begins to swell from above downwards. It becomes hard, pits with difficulty, is of milk-whiteness, and gradually extends, to involve the whole leg. The veins are in no way involved, except secondarily through pressure of lymphatic pressure, or by extension of the infection to the intima of the small veins. But, in no sense is this a primary thrombophlebitis. If the infection is short-lived the swelling will eventually completely disappear, owing to the restoration of the lymphatic circulation. If, on the other hand, the lymphatic stasis is of considerable duration there will result a permanent and more or less complete blockage, with varying degrees of swelling. It is, I think, always possible, in the early stages, to distinguish between lymphatic stasis and thrombophlebitis of the legs, though the remote results may be singularly similar and confusing.

EXTENSION BY THE BLOOD VESSELS

Pelvic thrombophlebitis contributes the largest number of tragic and unexpected deaths in puerperal infections. It is, by far, the most common type of pelvic infection, and is one that is least often diagnosed. The reason for this lies in the fact that pelvic thrombophlebitis, uncomplicated by a simultaneous lymphatic or mixed infection, involves only the vein wall and its lumen, and is free from symptoms of any kind until remote complications arise, and these are usually of a very serious nature. Infections that travel by the veins are insidious, creeping and, except in the severe cases, kill, not as a result of the infection but, by an accident of that type of infection, namely, 'embolism'. Emboli of pelvic origin always lodge in the lungs, and so insidious is the primary pelvic condition that the onset of any severe acute pain in the chest during the puerperium should be looked upon as embolic in character, until we prove it otherwise. The incidence of pelvic thrombophlebitis and of small lung infarctions is much higher than any one is likely to assume, unless he is on the lookout for the minor small infarctions. The larger ones are nearly always lethal, and the recognition of an earlier and smaller infarction may prevent the larger and more dangerous one, by leading to the adoption of precautionary treatment. Uncomplicated pelvic thrombophlebitis may be suspected but is seldom diagnosed, except when one or both of two complications arise, namely, pulmonary embolism, or a remote metastatic thrombophlebitis.

Not only is pelvic thrombophlebitis insidious but it differs very markedly in its clinical types. The vast majority of these cases are mild infections beginning in a deep cervical tear or in the placental site. The lower the implantation of the placenta, the greater the incidence of thrombophlebitis. In the mild infections, which are the most dangerous, the infection involves only the intima and the sub-intimal tissues. It is a

debatable and interesting problem whether the infection starts in the vessel wall or in the clot. However, the clot becomes attached at a part of the vessel intima where the phlebitis exists, but the thrombus may extend widely along the blood stream by a process of accretion of fibrin. In one case the free portion of the thrombus was eleven inches long, floating in the stream, attached only at its distal end. The portion to become detached is frequently minute, in other instances quite large. The size of the detached portion will determine the size of the infarct in the lung. Pulmonary infarctions are frequently multiple; hence the importance of their early recognition. Now, it is a well known clinical fact that embolism seldom occurs in the severe infections of a thrombophlebitic nature when the fever and the systemic symptoms are most pronounced but, by an irony of fate, embolisms are much more likely to occur in the very mild infections, or when the severe infections are reaching the stage of defervescence and recovery.

Another means of diagnosing a suspected thrombophlebitis is by a remote metastasis in the leg or elsewhere. It is only of late that this metastatic process has been understood. I think the organism of thrombophlebitis, an anærobic streptococcus, is specific, or approaches what we designate as 'specificity.' However, it has stamped upon it certain well defined predilections, and predilection and not morphology is the basis of most bacterial specificities. Be that as it may, when the organism of thrombophlebitis breaks away from its original site it implants itself upon similar or closely allied tissues. A remote post-operative or puerperal thrombophlebitis of the left leg (a favourite site) is usually secondary to a primary focus of thrombophlebitis at the site of operation in post-operative cases, or in the pelvis in puerperal cases. The thrombus at the primary site of infection develops a small vomicæ of liquefaction. This liquefaction is microbic in character, and is a suspension of broken-down blood cells. The area of liquefaction extends until it reaches the surface of the clots, evacuates itself into the blood stream, and is in such a fine state of division (broken down red blood cells and streptococci) that it passes through the capillaries of the lungs and gets into the general circulation. Now it chooses its new nidus. This will be the intima of a vein, and the most favourable vein will be a varicose vein, where the blood stream is retarded; lacunæ are formed, nutrition is defective, and injury frequent. What part of the human body has these characteristics more pronounced than the left leg and, more particularly the left saphenous, unsupported by muscle and subject to varicosities and injuries? Hence, its frequent involvement.

From the foregoing it will be evident that a thrombophlebitis of the leg is strong presumptive evidence of a primary focus elsewhere. Of course there are exceptions. Pelvic thrombophlebitis seldom breaks down into pus formation, but the same cannot be said of its complications. Lung infarctions frequently break down into lung abscesses, and remote metastatic thrombophlebitis sometimes breaks down into an abscess. In lung abscess I think the inference is justified that secondary infection occurs. In the case of remote metastatic abscesses the inference is not so clear or so tenable.

Since simple pelvic thrombophlebitis is so insidious and symptom-free, and is diagnosed only by its complications, we are justified in the assumption that the primary condition is a much more common pelvic pathological entity than any of us suspect. I look upon every case of silent infection in the pelvis as possibly thrombophlebitic in character until the patient has had five days of absolutely normal temperature and pulse. Even this precaution will not save all the cases from death by embolism. When looking over the pathological specimens in the museum, I was struck with the number of cases of death by embolism, weeks and, in a few cases, months after apparent cure of the infection. It would seem that, in a certain percentage of cases of thrombophlebitis, the thrombus formation is the chief factor. In others the phlebitis is the dominant pathological feature. A close examination of these cases brings out the fact that it is in the former group that late embolic complications are most likely to develop.

(To be continued)

RESULTS OF EXCESSIVE FASTING.—At the inquest over the death of Sacco, the famed faster, the coroners laid the causes of the death to cardiac failure, dropsy, and cirrhosis of the liver.

Sacco died a month after completing a fast of sixty-five days which broke the world's record. A doctor advised him not to undertake this fast, it was stated at the inquest, but he insisted upon allowing himself to be shut up in a glass case in a Blackpool amusement hall. Thousands of holiday-makers visited him during that time.

In 1906 he created a sensation by fasting forty-five days in London. Since then he has made other long fasts, but in recent years did not enjoy the best of health. He collapsed last year while undergoing a fast at Southend-on-Sea. During his long fasts Sacco took mineral water and smoked innumerable cigarettes.

Sacco's real name was Richard Hans Jones. He was born in Holland of English parents, forty-eight years ago, and as a young man he was a baker.—*Hospital Progress.*

Men and Books

THE REMAINS OF WILLIAM HARVEY

BY ROSS MITCHELL, M.D.,

Winnipeg

Those who attended the Montreal meeting of the Canadian Medical Association in June were privileged to see the Harvey Film prepared for the Royal College of Physicians of England to commemorate the tercentenary of the publication of that epoch-making work, "De Motu Cordis." The film showed the various experiments performed by Harvey to demonstrate the circulation of the blood, and the enjoyment experienced in seeing those beautifully clear moving pictures was heightened by the charming introduction given by Dr. Pariseau. A little in advance of that meeting Dr. Archibald Malloch's brochure on "William Harvey" had appeared on the market and was eagerly read by those who already knew Dr. Malloch as a medical historian gifted with a delightful literary style.

Some few weeks ago a friend handed the writer a yellowed page from the Scientific American Supplement, dated January 25, 1879. This contained an article taken from *The Lancet* on "The Remains of William Harvey," written by Benj. W. Richardson, M.D., F.R.S. This article was illustrated with six figures, (1) Profile of Bust; (2) The Harvey Memorial Tablet and Bust; (3) Inscription on Breast-Plate of Sarcophagus from the Rubbing of the Plate; (4) Harvey's Burial Place—Hempstead Church, from the Western Side; (5) Hempstead Church, from the Eastern Side; (6) Interior of Vault, and Sarcophagus containing Remains of Harvey.

The article begins with a description, after Aubrey, of the death and burial of our greatest English anatomist. "On the third day of June, 1657, about ten in the morning, Harvey, then in his eightieth year, on attempting to speak found that he had lost the power of utterance—by and by in the evening of the day in which he was smitten he died, the palsy giving him an easy passport. The funeral took place a few days afterward, his body being attended far beyond the walls of the city by a long train of his friends of the College of Physicians, and the remains were finally deposited in a vault at Hempstead, in Essex, which his brother Eliab, had built. He was lapt in lead, and on his breast, in great letters, his name, 'Dr. William Harvey.' "I was at his funeral," continues Aubrey, "and helped to carry him into the vault."

Dr. Richardson then relates how he became interested in the remains of Harvey. In his early life he was assistant to a surgeon of Saffron Walden, some seven miles from Hempstead. About Christmas, 1847, he attended the wife of a cottager, who lived near Hempstead, and while waiting in the night, he heard from the husband of his patient an interesting story of the chapel and vault of the "great Dr. Harvey." Gradually it dawned upon him that the Harvey referred to must be the discoverer of the circulation of the blood. A few days later he visited the church, and a year or two later, when he became acquainted with Dr. Robert Willis, whom for a time he joined in practice at Mortlake, he reported to him the condition of the remains for a proposed new edition of the life of Harvey. This edition subsequently appeared in 1878.

So far as he could learn in 1847, the vault containing the remains of Harvey had not been visited by men of science within the memory of any person in the village of Hempstead, neither had any one been curious about it. The vault had been long and grievously neglected. It was practically open to the public for the window at the eastern end was uncased and badly barred, and the leaden shell in which Harvey lay on the floor was exposed to drift of rain from the east. Boys could throw stones upon the leaden sarcophagus and did so.

In 1859 a visit to the remains was made by Drs. Stewart and Quain, at the request of the Royal College of Physicians. They found that the case had been penetrated by a crack in the lead. After their visit and report some repairs were made in the vault and when Dr. Richardson made another pilgrimage to Hempstead in 1868 the vault looked comparatively fresh, clean and dry. Many of the other coffins and leaden cases containing the remains of the members of the Harvey family had been neatly arranged and the sarcophagus containing Harvey was clean and dry. The opening in the sarcophagus, however, had become so large that two or three fingers could be introduced into it. At this visit Dr. Richardson examined the marble bust of Harvey in the Harvey Chapel within the church and was led to the conclusion that the sculptor had copied from a cast of the face taken after death.

On July 19, 1878, in company with his friend, Thomas Woolner, R.A., he paid another visit to Hempstead Church. Mr. Woolner, after very careful examination, also came to the decisive conclusion that the bust was from an after-death cast. These lineaments indicate a face at once refined, reflective and commanding, a far nobler portrait of the man, in Dr. Richardson's opinion, than any that has passed to us from the hand of the painter.

In addition to the sarcophagus containing the remains of William Harvey there were, at the time of Dr. Richardson's visit, several other leaden shells containing the bones of other members of the Harvey family. Of these the most illustrious is Admiral Sir Eliab Harvey, who died in 1830, and was one of Nelson's captain

at Trafalgar. In the crisis of this victory, as Dr. Michael Grabham relates, when one side of Harvey's ship was torn asunder he managed to get his remaining intact broadside to bear upon a fresh enemy ship, "black with boarders," with annihilating effect. Admiral Harvey is also commemorated by a monument in the Harvey Chapel within Hempstead Church.

On St. Luke's Day, the 18th of October, 1883, William Harvey's remains in the leaden case were removed from the vault, which had become ruinous, and were placed in a white marble sarcophagus. The President and twenty-six Fellows of the College were there, of whom that devoted disciple of Harvey, and later President of the College, Norman Moore, was the youngest.

Hempstead lies in a sparsely peopled district of Essex, seven miles from any important town, and equally remote from railway communication. The parish church is probably 500 years old, and is built of hard chalky stone on gravel, which in the country is regarded as unstable and shifting if the stratum has the slightest tilt. Hence, the massive tower of Hempstead Church, with its clock and fine peal of bells, collapsed forty-seven years ago, and the heap of ruins remains in the churchyard to-day.

The British Medical Journal of December 7th, 1929, carried an appeal to the medical profession for funds to rebuild the tower with the old materials. Upwards of £1,000 have been collected toward the £5,700 required to meet the estimated cost of rebuilding the tower. It would seem a fitting thing to restore to its former appearance the church which enshrines the remains of one whose name shines brightest in the annals of British medicine.

SURGEONS WHO WERE NEVER SURGEONS

Dr. Francis Thomas McDougall seems to have been the only English bishop who passed the examinations and was admitted a Fellow of the Royal College of Surgeons of England. His father was a captain in the 88th Regiment who was quartered at Malta at the time of his son's birth in 1817; his mother was a woman of strong evangelical principles, and the bishop during his life was able to use all his qualities, both inherited and acquired. He was a first-rate fighter, an excellent doctor, and a sincere divine. He entered as a medical student at King's College, London, in 1835; matriculated at Oxford from Magdalen Hall in 1839; was for a short time medical officer to some ironworks in South Wales, and married the sister of Bishop Colenso's wife. The ironworks failed, McDougall was ordained, served as a curate at Christ Church, Woburn Square, accepted a permanent post in the British Museum, repented, undertook mission work in Borneo, and was consecrated Bishop of Labuan in 1855. In 1862 he had an exciting fight with Malay pirates, and sent an account to *The Times*, in which, quite unostentatiously, he shows himself to have been a first-class fighting man, a surgeon, and a priest. Some exception was taken to the tone of his letter by the "unco guid," for he says: "My double-barrelled Terry's Breech-loader, made by Reilly, New Oxford Street, proved itself a most deadly weapon from its true shooting, certainty, and rapidity of fire. It never missed fire in 80 rounds, and was then so little fouled that I believe it would have fired 80 more with like effect." Dr. Tait, Bishop of London, when he next met McDougall, told him dryly that when there was occasion for another letter of a similar character it would be better if he let his wife write it for him.

After resigning his bishopric in 1868, McDougall became vicar of Godmanchester in Huntingdonshire, and afterwards a canon of Winchester, archdeacon of the Isle of Wight, and rector of Mottistone with Shorwell, where he is still remembered as a small, somewhat portly person who could occasionally be prevailed upon to tell of his early experiences when he had demonstrated anatomy at King's College. He died in 1886.—Sir D'Arcy Power in *The Lancet* **2**: 628, October 5, 1929.

Alfred Smee had the post of surgeon to the Bank of England specially made for him that the Bank might retain his scientific services. He invented "Smee's battery," a durable writing ink, a method of printing cheques and notes, and rendered it impossible any longer to split bank notes. He was, too, a physiologist interested in the electrical parts of the science, and had he still been alive would have been amongst the foremost electrical engineers. Whilst he was still a student he invented the "gum and chalk" splints, which were superseded by plaster-of-Paris, which in turn were replaced by celluloid.

LITERAL "HARDENING" OF PHARAOH'S HEART

Lord Moynihan, President of the Royal College of Surgeons, lectured recently at Leeds on "Surgery Ancient and Modern." He showed some remarkable photographic slides of the results of surgical operations performed a thousand years before Christ, and of the actual anatomical remains of the Pharaoh of Moses' time, and of those of Napoleon.

Perhaps the most interesting visceral discovery, was that which afflicted the Pharaoh of the Oppression. The large vessel springing from the heart of this monarch was found in such a well-preserved state that Mr. S. G. Shattalk, of the Royal College of Surgeons, was able to make sections of it and compare them with those made from a man recently dead. Lord Moynihan showed two sections side by side on a lantern slide, and no pathologist could tell which was the ancient and which the modern vessel. Both were attacked by atheroma, a condition in which

calcium salts were deposited in the walls of the vessel, making it rigid and inelastic. The vessel did not expand adequately to the stream of blood coming from the heart. Blood pressure was therefore high, and the vessel was apt to give way, forming an aneurism, or, if the ruptured vessel was in the brain, a "stroke." Mental changes went with that rigid arterial system. There was a narrowness and rigidity of outlook, loss of enthusiasm, or dread of new adventure, and restriction in all enterprise. They had the clearest proof that those mental defects were not lacking in Menephtah, for the Book of Exodus, chapter nine, verse 12, said, "And the Lord hardened the heart of Pharaoh, and he hearkened not unto them." It was interesting to have an ocular demonstration of the truth of the Old Testament.

Professor G. Elliot Smith, in a letter to *The Times*, writes as follows:—

"The full story has never been told of the incident to which Lord Moynihan referred as 'the most interesting visceral discovery.'

The wrappings were removed from the mummy of the Pharaoh Menephtah on July 8, 1907, on the instructions of M. Gaston Maspero, K.C.M.G., at that time Director-General of the Antiquities Service in Egypt. The mummy had been found in 1898 in the tomb of Amenophis II., in the Valley of the Tombs of the Kings at Thebes, its discoverer, M. Loret, being under the impression that it was the body of the so-called heretic king Akhenaten, but M. Groff called attention to the hieratic writing on the shroud, which established its identity as Menephtah.

Several years before the discovery some excitement was aroused by the discovery at Thebes of a stela of Menephtah's reign which was supposed to contain a reference to Israel. Hence, when I informed M. Maspero that it was essential to examine Menephtah for the report on the Royal Mummies I was then writing for the General Catalogue of the Cairo Museum, he at once said, 'We must invite the missionaries to be present at the unwrapping.'

While I was removing the bandages from the mummy M. Maspero was busy telling the visitors of a tradition of the Alexandrian epoch that Menephtah was the Pharaoh of the Exodus who perished in the Red Sea. Hence, when the mummy was exposed and I called attention to the unique phenomenon of the incrustation of the body with crystals of common salt M. Maspero at once turned to the missionaries and said:—'There you see the confirmation of the Red Sea episode.' And when (examining the body, which ancient tomb-robbers had hacked with an axe) I found calcified patches on the aorta, M. Maspero at once added: 'and his heart was really hardened.' One of the broken pieces of his damaged aorta M. Maspero allowed me to send to the late Professor Shattock, of the Royal College of Surgeons, who described it in *The Lancet* on January 30, 1909."—*The Weekly Times*, October 31, 1929.

DR. BARNES ON APE-LIKE MAN.—The Bishop of Birmingham (Dr. Barnes), preaching in Manchester Cathedral, spoke on the problem of human immortality in relation to the recent discovery of the sub-human fossil remains, colloquially termed Peking Man. After recalling the demand for some fossil, half-ape, half-man, which followed Darwin's publication of "The Descent of Man" in 1871, the Bishop traced the history of the fossil discoveries in Java in 1891, at Piltdown, in Sussex, in 1911, and in 1926, and onwards, in China. In due course, he said, experts would be able to tell, from their examination of the sub-human skull lately found embedded in the limestone rock near Peking, something of the quality of the brain of the sub-man of Peking. Then we should know more fully what rudimentary man was like 400,000 years ago, when the marks of his ape-like origin were many. How did discoveries such as that of Peking Man affect theological belief? Many were perplexed as to how it was possible, in the light of our growing certainty as to man's animal origin, to believe that the soul of man is immortal. People were asking, at what stage of our evolution did the soul within us become worthy of eternal life? Must we too perish absolutely at death as did the animals from which we had sprung? Our knowledge was still deplorably limited. We could not say when moral consciousness began. Yet with the beginning of moral consciousness man made the step which decisively separated him from all other animals upon earth. He was convinced that the ground of a reasonable belief in personal immorality was to be found in the fact that men were loyal to goodness and truth. The good man would survive after bodily death because he had survival-value. We could not continue to think of the Universe as rational, or its Creator as other than a capricious maker of useless experiments, if men who had sought to serve Him perished utterly as their bodies decayed. Would there be no further development of personality for any of us after death? He could not believe that a static future awaited us. He looked rather for development, achievement, and enrichment.—*The Weekly Times*, March 13, 1930.

Association Notes

BRITISH AND CANADIAN MEDICAL ASSOCIATIONS ANNUAL MEETING: WINNIPEG, AUGUST, 1930

Historical Sketch of Manitoba

BY ROSS MITCHELL, M.D.,

Winnipeg

In 1867 four provinces, Ontario, Quebec, Nova Scotia and New Brunswick, which up to that time had been politically separate, entered into confederation and the Dominion of Canada was born. One of the first problems to be dealt with by the first Federal Government was the creation of a new province out of that vast district west of Ontario which was under the control of the Hudson's Bay Company. Some preliminary work had already been done. In 1859 the licence of the Hudson's Bay Company was due to expire, and the Parliament of Canada of that time, which meant Ontario and Quebec, petitioned the British House of Commons not the renew the licence. A committee of the British Parliament was appointed to investigate the matter and after hearing evidence reported that the districts along the Red and Assiniboine Rivers, were likely to be needed soon for settlement, and that "arrangements should be made by which these districts may be ceded to Canada upon equitable principles, and within the districts thus annexed to her the authority of the Hudson's Bay Company would, of course, entirely cease." Meanwhile, the Canadian Government sent out an exploring expedition under S. J. Dawson and Professor Hind. Dawson's duty was to survey a road from Lake Superior to Fort Garry at the junction of the Red and Assiniboine Rivers, while Professor Hind was to report on the vegetation and soil of the country. Parts of the Dawson road are still being used and Hind's report was illuminating. It is of interest to note that R. M. Ballantyne, the novelist, was one of Hind's party.

As a result of the investigations, the new Federal Government decided to purchase the rights of the Hudson's Bay Company. For a payment of £300,000 the Company surrendered its rights in Rupert's Land, reserving only one-twentieth of the fertile land and a reserve of 500 acres around each post. Thus, in Winnipeg, a large area on which are located the old gateway of Fort Garry, the Fort Garry Hotel, the new Hudson's Bay store and the Legislative Building is still known as the Hudson's Bay Reserve.

The new province, Manitoba, entered Confederation on July 1st, 1870. Its birth, however, was not uncomplicated. A large number of the inhabitants of the Red River Settlement were French halfbreeds or "Métis," and the prospect of an influx of settlers from Ontario, English speaking and of another religion, who would till the soil and drive away the herds of buffalo on which the Métis had depended for subsistence, did not please them. The arrival of Canadian surveyors to institute a new square block survey of land in place of the long narrow river lots served to fan the discontent. Under the leadership of Louis Riel, a young man who had received education for the priesthood but had never taken orders, the discontent broke out into flame. A Provisional Government was formed; Fort Garry was seized. The Hon. Wm. MacDougall, who had come from Ottawa to be the new Governor, was not suffered to enter; many prominent citizens were imprisoned, and, finally, a young Irish-Canadian, Thomas Scott, was shot after a mockery of a trial. The fate of Scott created intense indignation in Ontario. It was agreed with the British Government that an armed force supported by both governments should be sent out. This force was composed of British Regulars and volunteers from Eastern Canada under Colonel, later Field Marshal Lord Wolseley. After struggling through the wild rocky region between Lake Superior and the Lake of the Woods, it reached Fort Garry in August, 1870. Just before the arrival of the advance guard, Riel and his two lieutenants, who by that time had been deserted by most of their followers, quietly slipped out of the fort and the Provisional Government ceased to be. It is of interest that among Riel's prisoners in Fort Garry were Dr. J. C. Schultz, afterward Hon. Sir John Schultz, fifth Lieutenant-Governor of Manitoba, and Dr. Cowan.

The name Manitoba, is derived from two Indian words, Manito-bau, the "Spirit Strait." In the narrows of Lake Winnipeg there is an island on which the limestone is very compact and resonant. When the waves beat against the beach the roaring sound was thought by the Ojibways and Crees to be due to the Great Spirit beating a drum. The early spelling was Manitobah, the accent being placed on the last syllable, but the final "h" was soon discarded and the accent is now on the third syllable.

As first constituted, Manitoba was square in outline, and so small that it was called, "the postage stamp province." In 1881, the

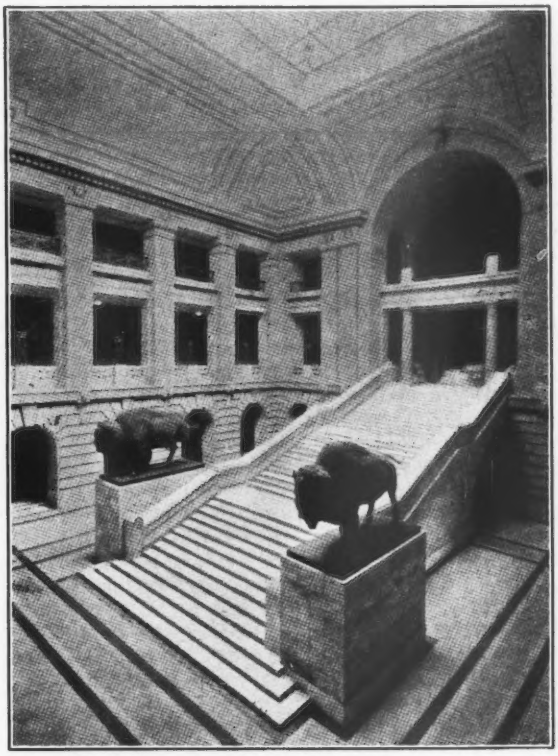
boundaries were extended, and in 1912 a further extension of the boundary northward gave Manitoba the two best harbours on Hudson Bay, Nelson and Churchill, and 500 miles of coast-line. By this change the tiny province of 1870, containing 13,000 square miles, reached its present size of 251,000 square miles, just double that of the British Isles.

The Hudson's Bay Railway, long thought to be only a visionary enterprise, has, by the action of the Dominion Government, become a fact, and steel has been laid from The Pas, Manitoba, on the Saskatchewan to Churchill on Hudson Bay. Close to its terminus lie the ruins of Fort Prince of Wales. The first fort was built of wood by the Hudson's Bay Company in 1717; the second, five miles down the river, built of stone and of tremendous strength, was begun in 1731, after plans drawn by Marlborough's engineers, and completed in 1746. In 1782, the French, under Admiral La Perouse, surprised the fort, captured it without firing a shot, and blew it up. In 1930, passenger trains will be running from Winnipeg to Churchill on a well-ballasted track.

Mention of the railway summons up visions of how transportation has been effected in the past. The first means of transport used by the fur traders were birch-bark canoes, which had the merits of lightness, buoyancy, ease of repair, cheapness, and facility of construction, as all the materials necessary could be found in the forests. They were, however, very vulnerable and could not be used to convey very heavy or bulky objects. About 1826, one of the Hudson's Bay Company's factors introduced the York boat, modelled after the old Norse galleys. The York boat was of a type light enough to be taken on rollers over portages, strong enough to shoot the rapids, sufficiently seaworthy to cross such stormy lakes as Lake Winnipeg, and roomy enough to carry a cargo of eight pieces, each of one hundred pounds, besides a crew of eight voyageurs, including bowsman and steersman. They were propelled with oars about twenty feet long and with one large square sail.

As the Red River settlement increased in numbers the settlers' needs could not be met by the Hudson's Bay ship which came annually to York Factory on Hudson Bay. Traffic sprang up between the Red River settlement and St. Paul in Minnesota, which was on a line of railway. Goods were transported in brigades of Red River carts, drawn by oxen or native ponies. These two-wheeled carts were made entirely of wood and could be made with only a saw, chisel and draw-knife. Each cart could carry about one thousand pounds. These in turn, were superseded by flat-bottomed stern-wheel steamboats, which for some twenty-five years travelled up and down the Red and Assiniboine Rivers between points in Manitoba and Minnesota. In 1878, railway communication was established between Pembina in Minnesota and St. Boniface across the Red River from Winnipeg, and in July, 1881, the first train of the Canadian Pacific Railway entered Winnipeg. Within the last few months arrangements have been completed for regular air mail service throughout the west.

Manitoba's first cabinet was formed on June 12, 1871, when the total provincial population was 11,693 of which the white race numbered 1,565. When Winnipeg was incorporated in 1873 the new city could muster only 215 inhabitants. The present population of Greater Winnipeg is 336,202, and the population of Manitoba in 1926, according to the Dominion census, was 638,000 of which only a few thousands were Indians. When Manitoba entered Confederation the Dominion Government retained control of the natural resources. Repeated attempts were made by provincial governments to have these resources transferred to the province, but it is only within the last months that these efforts have been successful. How valuable these natural resources—water powers, forests, and, above all, minerals, are, no one can say, but the present indications are that as further development takes place they will prove to be tremendous assets. The Minister of Natural Resources has recently stated that the water power available in the Nelson, Churchill, and Winnipeg Rivers in the province totals 5,000,000 horse power.



Stairway, Manitoba Legislative Building

Much of the history of the Red River Settlement and Manitoba has been incorporated in the new Legislative Building. The design of the architect of the building, Frank Worthington Simon, F.R.I.B.A., of Liverpool, was that what was best in the Past should be preserved and wrought by the hand of the Present into the structure emblematic of Manitoba—"The Land of the Great Spirit." The southern entrance looks toward the Assiniboine River, along which passed the early explorers, fur traders, and colonists. At the eastern entrance are the stone figures, heroic in size, of La Verendrye, the first white man to open up the Canadian West, and Lord Selkirk, the first to establish a colony. At the western entrance one sees the figure of Wolfe, who, visioning Canada as one of the units of the British Empire, gave his life for that vision, and of Lord Dufferin, the first Governor General of Canada to visit our West and catch a glimpse of its possibilities. In 1877, he spoke these words in Winnipeg, "Manitoba is destined to be the keystone of a mighty arch of sister provinces stretching from the Atlantic to the Pacific." Most impressive is the main entrance which, prophetically, looks to the north. Six fluted columns of stone with Ionic capitals support an entablature in which Alfred Hodge has portrayed an allegory of the Dominion worthy of much study.

The stone of which the building is constructed carries the mind back to far-off geological periods. It is a limestone quarried at Tyndall near Winnipeg, of great strength and beauty, bearing marks of fossil ferns and aquatic animals.

Entering on the north one sees the main staircase flanked by two bronze buffaloes, emblems of the province, sculptured by Gardet, of Paris. The staircase leads to a rotunda under the dome and the eye is arrested by the great Brangwyn mural painting of scenes in the Great War.

The legislative chamber is one of quiet dignity and beauty. The mural decorations by Augustus Tack are woven about the theme, "The Origin of Legislation." On the other side of the Speaker's chair are massive bronze statues of Moses and Solon.

From the centre of the building rises a square tower surmounted by a dome on which is poised the gilded bronze figure of a boy typifying Eternal Youth, the Spirit of Enterprise. The figure was cast in a foundry seventy miles from Paris. During the war the foundry was completely destroyed by bombing, the figure alone remaining unscathed. It was rushed to a seaport and put in the hold of a vessel bound for America. Before it drew out of port the boat was commandeered to transport American troops, and for two years the bronze figure was carried in the ship through submarine-infested waters. At the close of the war it was brought to New York and thence to Winnipeg. The attitude of the boy who seems to have poised in flight for a moment is that of a runner, his face to the north, signifying that the spirit of enterprise, capable of enduring hardships, sees the vast possibilities of the northland with its wealth of natural resources. Under his left arm he carries a sheaf of golden grain and in his right hand, uplifted, he holds a torch, *vitæ lampada*, recalling McCrae's lines—

> "To you from failing hands we throw
> The torch—be yours to hold it high!"

LEADERS IN BRITISH MEDICINE

COMYNS BERKELEY, M.A., M.C., M.D. (CANTAB.), M.R.C.S., F.R.C.P.

The chairman of the Section of Obstetrics and Gynæcology at the coming meeting of the British Medical Association will be a man whose name and fame are known to many. Dr. Comyns Berkeley has been an outstanding figure in his special line for more than a quarter of a century, and there are few graduates in medicine in the British Empire who do not know Berkeley and Bonney's "Difficulties and Emergencies of Obstetric Practice," or his textbook, "Gynæcological Surgery." Other works by Dr. Berkeley are: "A Handbook for Midwives and Obstetric Dressers," "Gynæcology for Nurses and Gynæcological Nursing."

Dr. Berkeley was educated at Marlborough and Caius College, Cambridge. Entering Middlesex Hospital in 1888, he has filled many positions there, and is now Obstetric and Gynæcological Surgeon to that institution. In addition, he is Consulting Obstetric Surgeon to the City of London Lying-in Hospital; Consulting Surgeon to Chelsea Hospital for Women; and Consulting Gynæcological Surgeon, Eltham. During the war he was in charge of the Middlesex War Hospital, Clacton-on-Sea. Dr. Berkeley is editor of the *Journal of Obstetrics and Gynæcology of the British Empire.*

In 1895, Dr. Berkeley married Ethel, youngest daughter of E. King Fordham, D.L., J.P., of Ashwell, Herts. His recreations are travelling and golf.

ROBERT HUTCHISON, M.D., F.R.C.P.

Dr. Robert Hutchison, who comes to Winnipeg as President of the Section of Diseases of Children, is physician both to the London Hospital and to the famous Children's Hospital, Great Ormond Street. He was born at Kirkleston, N.B., in 1871; was married in 1905 to Letitia Norah, daughter of the Dean of Worcester, and has three sons and one daughter. Educated at the Collegiate Schools, Edinburgh, and at the Universities of Edinburgh, Strasbourg, and Paris, he was distinguished for scholarship, especially in physiology. He is a Fellow of the Royal College of Physicians, and in 1904 delivered the Goulstonian Lectures before that body; also, Fellow of the Royal Society of Medicine. His

publications are "Food and the Principles of Dietetics," 1900; "Patent Foods and Patent Medicines," 1904; "Lectures on Diseases of Children," 1904; "Applied Physiology," 1908; "Lectures on Dyspepsia," 1925; "Clinical Methods' and various papers in medical and scientific journals.

Canadian Medical Association

PROGRESS REPORT OF THE JOINT COMMITTEE ON NURSING

At the end of the first four months of the Survey, one thing emerges with unmistakable clarity—the need for it was pressing. Even the members of the Joint Committee, who have been considering every aspect of the situation for the last two and a half years, scarcely realized the extent of this need until the Director made his first report.

As was pointed out before, Toronto was selected as the headquarters of the Survey, in order that the Director might be in close touch with the Committee. The first two months were spent largely in getting the machinery of the whole Survey started. The last two months have been spent largely in field work in Ontario. Similar field work will be carried on in the other provinces.

The extent of the field work which Professor Weir has carried on during this period would lead one to believe that he spent twenty-four hours a day on his job. During this period he has held 175 conferences and interviews with doctors, nurses, and hospital trustees, getting their points of view, listening to their opinions and acquiring information. Large and small hospitals were visited, twenty-two in all, and before the end of this month many more will be visited. Twenty days have been spent in visiting Training Schools (not including time spent in Toronto schools), attending lectures, demonstrations, etc. The Director has also made 700 psychological examinations of student nurses in both large and small schools.

The following studies are under way,—

(a) Special and General Questionnaires.
(b) Studies of Community Needs—in co-operation with the Social Service Department of the University of Toronto.
(c) Curriculum Study (Job Analysis)—in co-operation with the Department of Psychology of the University of Toronto.
(d) Examinations and Examination Standards including the registration examinations.
(e) Problems in Educational Psychology and Pedagogy.
(f) Cost Accounting of Nursing Education—as distinct from general nursing care. Over 100 hospitals will probably be investigated.
(g) General Studies—
    (1) Economic—supply and demand, unemployment, fees, the special nurse, etc.
    (2) Educational—the type of entrant, preliminary education, curriculum, methods of instruction, examination standards, small training school, etc.
    (3) Sociological — Community needs—hourly nursing, etc.
    (4) Rural and urban problems.

Professor Weir will start work in British Columbia at the beginning of March, but is also required to resume his own labours in his department at the university. Upon the completion of the session intensive field work will be undertaken in the other provinces.

With the organizing experience gained in the past month; with the inertia and lack of interest on the part of both nursing and medical professions largely overcome, progress of the Survey in the other provinces should proceed at an accelerated rate.

THE OSLER MEMORIAL

The Committee in charge of the Osler Memorial, for the Canadian Medical Association, again appeals to the members of the profession in Canada to supplement the contributions already received.

Canadian medicine cannot afford to neglect this opportunity, which is both a privilege and a duty to record their appreciation of the great work represented in the life of Sir William Osler. We know that he had roots in Canadian soil: birth, early life, school teachers' inspiration and training. From this beginning he rose to be a great world figure in medicine—the greatest in his day.

We would especially appeal for the co-operation of those who have already become interested and forwarded their subscriptions. Each and every one of these should make it his own particular affair to see that local interest is aroused, and that the officers of their Societies, local and provincial, exhibit the interest and activity necessary to guarantee a complete personal appeal and an early consummation of the program we have thus far outlined for their consideration.

The Chairman is Dr. J. H. Mullin, Hamilton, Ont.

EPIDEMIC ERYTHEMA MULTIFORME.—Levaditi, Nicolau, and Poincloux established, in 1925, that this disease is caused by *streptococcus moniliformis*. Recently, Levaditi and Selbie have discovered that this micro-organism infests the intestine of rodents, particularly mice. The infective agent can easily be transmitted to man through the contamination of flour and other foods by the excreta of mice.

Hospital Service Department Notes

RADIUM AVAILABLE IN CANADA

A survey of the radium available for therapeutic purposes has been made recently by the Department of Hospital Service. The total amount is somewhat more than five grams, distributed as indicated in the following table:

Province	*Amount owned by or loaned to public hospitals*	*Amount owned by private doctors or private institutions*	*Amount purchased by Provincial Governments*	*Total*
British Columbia .	106 mgm.	205 mgm.		311 mgm.
Alberta	80 mgm.	253.5 mgm.	80 mgm. (see 1st col.)	333.5 mgm.
Saskatchewan ...		185 mgm.		185 mgm.
Manitoba		300* mgm.		300 mgm.
Ontario	575 mgm.	1187.5 mgm.		1762.5 mgm.
Quebec	900 mgm.	96.5* mgm.	1250 mgm.	2246.5 mgm.
New Brunswick ..		75 mgm.		75 mgm.
Nova Scotia	210 mgm.	25 mgm.		235 mgm.
	1871 mgm.	2327.5 mgm.	1330 mgm.	5448.5 mgm.

A large amount of this radium is owned by private doctors or private groups—thirty in all. In the majority of instances the placques or needles are generously loaned to the local hospitals for the treatment of indigent patients. Actually but seven public hospitals possess radium of their own. The element is available in twenty-one centres and locations across Canada. In addition to this supply, many surgeons rent tubes and needles containing short-lived emanation for the treatment of individual cases.

The largest single supply of radium is 1250 mgm., which amount is the property of the Quebec Government and is deposited in the University of Montreal. It is largely used in the Institut du Radium. Alberta is the only other province which has purchased radium.

Committees of a number of the provincial medical associations have been active in studying the possibilities of cancer research, especially in Manitoba and Saskatchewan. When the real value of radium and its place with surgery in the treatment of malignancy become better known to the public and the legislators, this very creditable supply of radium in Canada should be considerably increased.

* We have not been able to confirm the amount of certain small private supplies.

* **All communications intended for the Department of Hospital Service of the Canadian Medical Association should be addressed to Dr. Harvey Agnew, Secretary, 184 College Street, Toronto.**

FURTHER TARIFF EXEMPTION REQUESTED ON HOSPITAL EQUIPMENT

Representations respecting revision of the present tariff regulations affecting hospitals have been made to the Advisory Board on Tariff and Taxation by our Department of Hospital Service, on behalf of the hospitals of Canada. It has been pointed out that a number of articles essential for the proper care of the sick are dutiable, despite the fact that such articles are not made in Canada. As is well known, surgical instruments of metal, x-ray apparatus, operating tables, and laboratory apparatus are now exempt, but these provisions, while in themselves extremely beneficial to our struggling hospitals, are not sufficiently broad to include the many pieces of equipment necessarily imported, and so essential to efficient hospital care. It is a fact that our hospitals spend many thousands of dollars annually on tariff imposts which are not, nor are soon likely to be, protection duties. Every dollar so spent means more cost to the patient, or so much less towards the purchase of other much needed equipment.

A brief, outlining the need for reconsideration of certain items in the interests of our charitable institutions, has been presented to the Tariff Board by the secretary of our Hospital Department. A wide range of hospital equipment has been included in this brief, which also embodies resolutions passed by various provincial hospital associations requesting further exemptions. It is to be hoped that the requests for concessions in this application will be given sympathetic consideration by the Tariff Board and the Minister of Finance and be laid before the House this session.

TARIFF ITEM 696 REVISED TO HELP HOSPITALS

It may not be generally known as yet to hospital authorities that at the last session of Parliament, item 696 of the Tariff Regulations, which has permitted free entry to scientific apparatus and instruments purchased by colleges, or religious, scientific and literary organizations was amended so as to include mechanical equipment not made in Canada and to extend these privileges to public hospitals. The amended item is here given, the added words being in italics, which italics are our own:

> Item 696—Philosophical and scientific apparatus, utensils, instruments, and preparations, including boxes and bottles containing the same; maps, photographic reproductions, casts as models, etchings, lithographic prints or charts; *mechanical equipment of a class or kind not made in Canada.* All articles in this item, when specially imported in good faith for the use and by order of any society or institution incorporated or established solely for religious, philosophical, educational, scientific or literary purposes, or for the encouragement of the fine arts, or for the use and by order of any *public hospital,* college, academy, school or seminary of learning in Canada, and not for sale, under regulations prescribed by the Minister.....FREE.

The Department of Hospital Service has taken up with the Customs Division of the Department of National Revenue the interpretation of this item as it applies to hospitals. A number of articles not previously exempt have been included under this item. These include electrical breast pumps, Diack controls, hæmocytometers (formerly dutiable, if in the ordinary case), teaching charts for nurses' training schools, and pathological stains. Motor-driven suction machines are admissible free of duty (item 466) with the exception of the motor, which is dutiable under tariff item 453 at the rate of 27½ per cent *ad valorem*, General Tariff.

It has been ruled that bed-pan washers and sterilizers, catheters, operating lights, glass syringes, food mixers and dish-washing machines cannot be considered as "scientific apparatus" or "instruments," or as "mechanical equipment" under this tariff item.

University Notes

Dalhousie University

During the present academic year the Department of Physiology has been enabled to have increased facilities for both teaching and research work. New benches and standing equipment have been added in the experimental laboratory for the first year course in Physiology. There remains yet much to be done in the way of securing the more costly pieces of apparatus which are essential for the work of the second and third year.

Facilities for research have been greatly added to by the conversion of a demonstration theatre into a private research laboratory. This laboratory has been well equipped for work on the sugar and gaseous metabolism of the normal and diabetic heart. In it have been placed 300 and 600 litre Douglas bags, a large gas meter, kymograph, a Haldane-Henderson gas analysis apparatus etc., etc.

The work at present being carried out is centred around the question of the action of insulin on the sugar storage of the normal and diabetic heart. Here an attempt is being made to estimate the utilization or synthesis of glycogen in the diabetic organism by an accurate estimation of oxygen utilization, care being taken to eliminate the part played by the living tissue. This work is being carried out on the dog because of the direct applicability of the results obtained to conditions obtaining in the human organism. The importance of a fuller knowledge of the many factors confronting those who are faced with the question of dealing with diabetic patients is too fully realized by medical men to require emphasizing. What does require to be stressed before the lay mind is the need of intensive study of the difficult problem of sugar metabolism, the fact, that by mammalian experimentation were part advances made and insulin discovered and that largely by this type of experiment can we arrive at a knowledge of the numerous chemical factors underlying disease. And further it should be remembered, that by this type of experiment the welfare of the human subject is carefully safeguarded. To-day the medical scientist is confronted with numerous difficult problems, and here as elsewhere the work is being hampered if not completely stopped because of the lack of material, the absence of a lively and intelligent public interest, and the determined efforts of a curiously minded minority to prevent research into the functions and disorders of the human subject.

During the past year original investigations in several different subjects have been in progress in the Department of Biochemistry. Uric acid, long regarded as an extremely insoluble compound, has been shown capable of being dissolved readily by numerous organic bases allied to the

alkyl amines. It has also been proved to exist in water that is essentially neutral in high concentration as a colloid capable of forming a jelly.

The products of the digestion of starch have been isolated by the most modern method of separating closely related chemical compounds—ultrafiltration. These dextrins are now being studied as to their chemical constants and characteristics.

A new method for the study of the different kinds of sugar which are found in human blood has been devised.

The composition of the sea weeds found in the Maritime Provinces has been determined by analysis. Several of our common species have been shown to be rich in potash and iodine, making them valuable natural resources. An intensive study of the carbohydrates found in them is in progress and it is possible that several practical applications may be found for them.

Prof. O. S. Gibbs, of the Department of Pharmacology, has arranged to film an experiment showing the use of an apparatus he has recently devised to replace the heart. Some of these experiments were discussed before the Annual Convention in Pictou last summer by Professor Gibbs, and he also gave a demonstration of his apparatus at McGill University.

Dr. Gibbs states that this apparatus enables a further study to be made into drugs acting on the circulation. At present the methods available are those involving isolated heart preparations. The artificial heart devised by Professor Gibbs enables a study to be made of the reactions of the circulation uncomplicated by the cardiac factor.

Already advantage has been taken of this apparatus, and certain experiments have been made on the behalf of an American College in San Francisco. More recently Dr. Ross, of the Pharmacology Department of McGill University, visited Halifax in order to add to an analysis that is being made of the action of pituitary extract in McGill.

While the experiment is not difficult to perform in a suitable laboratory it is not easy to transport the apparatus and give satisfactory demonstrations, although this was successfully accomplished recently in McGill. The idea of filming the operation naturally occurred and this has now been made possible by the generosity of Messrs. Parke, Davis and Company, who have provided a sum of $200.00 for the purpose.

Queen's University

Dr. J. C. Connell resigned his position as Dean of the Faculty of Medicine soon after the present session began. Suitable expressions of regret and appreciation, in view of his twenty-six years of distinguished service and wise leadership, were formulated by the Faculty and by the Board of Trustees. In addition, he received from the medical students a farewell address, signed by them all, and a magnificent grandfather clock.

Frederick Etherington, C.M.G., M.D., well known because of his surgical ability and on account of his successful command of one of the largest stationary hospitals in France during the war, was appointed Dean, and entered upon his new duties early in November.

Through the generosity of Mr. Samuel Insull, of Chicago, a Chair of Public Health and Preventive Medicine has been established at Queen's. It will bear the name of Dr. Arthur R. Elliott in whose honour Mr. Insull has endowed it. Dr. Elliott is doubly a graduate of Queen's, M.D., C.M., 1889, and LL.D., 1925. Since 1927 he has been Professor of Clinical Medicine in the Rush Medical College, of the University of Chicago.

A distinguished honour graduate of Glasgow University, John Wyllie, M.A., M.B., Ch.B., B.Sc. (Glas.), and D.P.H. (Camb.), has accepted the appointment to this Chair, and is expected to arrive in May. He has been assistant to Prof. Glaister and to Prof. Currie in the same department of studies in Glasgow, and has had practical experience as medical officer for the city of Dunfermline and the County of Bute.

T. GIBSON

MALARIA TREATMENT OF GENERAL PARALYSIS—Dr. T. Gerald Garry (Montecatini) writes: It may be of interest to know that it is the custom in Tanganyika (a custom which has possibly existed for centuries) for the native medicine men to send their patients suffering from general paralysis to malaria districts, and from reliable reports the results appear to have been satisfactory.—*Brit. M. J.* **2:** 80, July 13, 1929.

GIANT APPENDIX WEIGHING ONE POUND SIX OUNCES.—The appendix in the case reported by E. Dunbar Newell, Earl R. Campbell and J. Marsh Frere, an enormous bent pear-shaped cystic mass, measured 7 by 8 by 16 cm. and weighed 659 gm. The lumen at the site of removal from the intestine was 3 cm. in diameter. No acute inflammation was seen and the lumen was open from end to end, neither stricture nor stenosis being present. Microscopic examination revealed a thick dense wall composed entirely of fibrous tissue. No lining membrane was found, and only a flat, scant, serous coat was present. A diagnosis of mucoid cyst of the appendix was made.—*J. Am. M. Ass.* **92:** 2016, June 15, 1929.

Special Correspondence

The Edinburgh Letter

(From our own correspondent)

Since the passing of the Mental Deficiency and Lunacy (Scotland) Act of 1913, the various local authorities have been faced with the difficulty of providing homes and establishments for mental defectives. On the outbreak of war, operations under the act practically came to a standstill, and the provision of new institutions could not be undertaken. When the war was over there was a great shortage of accommodation, and this, unfortunately, could not be supplied owing to the financial stringency. Although this need still exists, considerable progress has been made in various parts of Scotland in attempting to solve this important problem. The Glasgow District Board of Control, despite the financial situation, has always been active in its endeavours to deal with this question. In 1927 the estate of Lennox Castle was purchased. This stately building occupies an elevated position in its own magnificent grounds. It is situated near the foot of the Campsie Fells and the Kilsyth Hills, amid beautiful surroundings, and within easy reach of Glasgow. Immediately adjacent are the ruins of the ancient Lennox Castle, one of the innumerable places where Mary, Queen of Scots, is said to have slept. At present the Castle, which is a comparatively modern building, is being used as a home for 150 female defectives. Ultimately this building will become the nurses home, and a village colony is to be erected for the accommodation of 1,000 mental defectives. At the same time, the Govan District Board of Control, which comprises that part of Glasgow south of the River Clyde, has not been behindhand. The Caldwell estate which extends to 280 acres, in the vicinity of Barrhead, 14 miles south of Glasgow, was purchased in 1923. This has now been formally opened as an institution for 100 male and female defectives. Further extensions are to take place in the near future, and pavilion dormitories and special nurses' quarters are to be provided.

An appeal for funds for the extension of the Edinburgh Royal Infirmary, which is to be erected on the ground at present occupied by George Watson's Boys' College, is to be launched in the spring of this year. On this site which lies immediately to the west of the present institution will be erected an obstetric and gynæcological hospital, containing upwards of 240 beds. The cost of the ground will be £90,000 and of the new buildings approximately £200,000. This projected increase of 240 beds, will entail an additional annual maintenance charge to the Infirmary of not less than £36,000.

The Court of the University of Edinburgh has appointed Col. Ronald B. Campbell, C.B.E., D.S.O., Director for the promotion of Physical Welfare of Students. It is an old complaint that Scottish higher education has given in the past too exclusive attention to the minds of students and left their bodies to look after themselves. In former days, libraries, laboratories, class rooms, and museums were provided and sustained with a lavish hand, but the athletic field, the tennis club, and the student societies were largely supported from extra-academic sources or by the students themselves. For some years this attitude has been changing, and the University authorities have been more sympathetic towards student athletics. The appointment of the new Director is another definite step forward. Col. Campbell is particularly well equipped for the task that lies before him. He was formerly Inspector of Physical Training in the Army.

Dr. C. G. Lambie, M.C., F.R.C.P., has been appointed to the Bosch Chair of Medicine in the University of Sydney, N.S.W. Dr. Lambie is an Assistant Physician at the Royal Infirmary and Lecturer in Medicine in the School of Medicine of the Royal Colleges. He worked under Professor Meakins in Edinburgh in the early days of the preparation and employment of insulin in this country. Four years ago he was awarded the Lister Fellowship of the Royal College of Physicians of Edinburgh for his work on carbohydrate metabolism.

The Local Government (Scotland) Act of 1929, under the provisions of which county councils and town councils of boroughs over 20,000 assume the duties of parish councils, district boards of control, and education authorities in all matters pertaining to health will come into force next May. One of the duties which these bodies will assume under their increased powers is the provision of medical treatment, either by utilizing existing faculties or establishing new institutions. In the south-east of Scotland, a Regional Professional Committee has been formed, consisting of representatives of the Royal Colleges of Physicians and Surgeons, of the British Medical Association, of the staffs of local hospitals and of the general practitioners. The object of the Committee is to co-operate with local authorities in such changes as may be contemplated under the new act. It hopes to be of assistance by giving an expression of the view of the medical profession on any proposals regarding hospitals at present in existence or new ones which it is proposed to erect.

The annual curling match between rinks of the Royal College of Physicians and the Royal College of Surgeons resulted in a victory for the Surgeons by 48 to 14.

The East of Scotland Overseas Medical Club, consisting of medical men who were on foreign service during the war, held its annual dinner on

Friday, February 21st, in the Hall of the Royal College of Surgeons. This was the night before the International Rugby Match against Ireland. Col. Lalean, C.B., C.M.G., the Professor of Public Health was in the chair. Col. Lalean was born in Canada, and served for a number of years in the R.A.M.C. He is the author of numerous scientific publications, including a text book on sanitation in war.

Thirty miles west of the Outer Hebrides, amid the restless waters of the Atlantic, lies St. Kilda. Only one of this small group of islands is inhabited, and the population through death and emigration is rapidly declining. Now only about thirty people live on that lonely spot. Some years ago these inhospitable rocks achieved a melancholy notoriety from the devastations of tetanus neonatorum among the infantile population. But since that sorry claim to the attention of the great outside world has passed away, St. Kilda lies lonely and well-nigh forgotten, except for the visit of ships in the summer season. In the beginning of this year the Department of Health in Edinburgh received intimation that one of the islanders was dangerousy ill. This was accompanied by an appeal for assistance. Dr. Shearer, of the Highlands and Islands Medical Service, was sent on the Northern Lights Ship Hesperus to attempt to reach the island. On rounding Ardnamurchan Point, the most westerly part of the mainland of Scotland, the Hesperus found a three-masted schooner flying signals of distress and in a very dangerous position. This was Neptune II of Newfoundland, which had been blown out of her course and had drifted for forty-eight days across the Atlantic. The Hesperus took her in tow and succeeded in getting her to Tobermory in the Island of Mull. There was something providential in this rescue. But for the appearance of the Hesperus, Neptune II, drifting on a lee shore, would have been on the rocks. The crew are said to have been so far out of their bearings that they did not know whether they were off the coast of Africa or of Scotland. Dr. Shearer ultimately proceeded on his voyage to St. Kilda, but the seas were so wild to the west of the Outer Isles that the Hesperus failed to reach the lonely island.

GEORGE GIBSON

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The London Letter

(From our own correspondent)

It is almost impossible for those actively engaged in practice at the present time to realize what great changes are taking place in the medical services of this country, while those who do pause and think out the situation are being driven to the idea of a state medical service in the not far distant future. Certain indications of how the change is taking place have recently appeared. For example a Medical Service Scheme has been working at Swindon for some time, where all the doctors in the town are working together, seeing patients in rota and providing attention for the entire population. In the county of Gloucester a scheme of medical services has now been in activity for eight years. Here the object has been to co-ordinate the work of the general practitioners, the hospitals, and the nurses in the locality for the public benefit. The county is divided into areas with a medical centre in each area, and the clinical work is done as far as possible by the general practitioners of each area. In this scheme it is the hospital class, that is for the most part that group of patients coming under the National Health Insurance Scheme, which is affected, but there are moves afoot to secure a wider application of such a scheme all over the country. At a meeting held at the House of Commons the other day preliminary measures were set on foot and an executive committee formed for a "Public Medical Service Association." The object of such an association is frankly to establish an all-embracing Public Medical Service available to every member of the community, rrespective of his ability or inability to pay. Such a service would aim at providing for all members of the community every necessary form of medical, surgical, obstetrical, dental, and preventive treatment, co-ordinated as one service under the Ministry of Health. It would entail the provision of all necessary institutional treatment, consultant and specialist services. Such a scheme sounds not only ambitious but likely to be met with considerable opposition on the part of the profession. Opposition, say its sponsors, was widespread to the Insurance Acts, and yet they are to-day an accepted part of the health services of the country. At any rate all these developments indicate clearly what the profession has very shortly to make up its mind about.

Drowning used to be the most popular method of committing suicide but of recent years coal-gas has largely superseded the cold and watery grave. Indeed the increase of suicides by ordinary domestic gas from 193, in 1918, to 1,191, in 1928, has considerably alarmed medical opinion, and the report of a Departmental Committee recently issued on this subject has been read with interest. In the first place it is emphasized that this increase in the use of coal-gas for suicide is not reflected in the statistics of total suicides; in other words the same number of people may take their lives, but show an increasing preference for coal-gas as compared with other means. At the same time there is an unhappy feeling left in the minds of those who study the subject that if less carbon monoxide were present in gas it would not be such a potent lethal substance, and it is common knowledge that the gas companies include more water-gas nowadays than previously, purely on economic grounds, and thus increase the percentage of carbon monoxide, especially in the cheapest forms of domestic gas. Mechanical faults are still apparently prevalent and account for many of the accidents from coal-gas. The

recommendations of the committee appear timid and no doubt in course of time stronger measures for the control of the gas companies may be necessary. Meanwhile the whole question of suicide will no doubt receive closer study by psychiatrists and social students.

On the slightly less depressing subject of bad teeth recent work is of interest. It has long been an observed fact that a person who habitually neglects all oral hygiene may have teeth quite free from caries, while another who takes the greatest care may yet find caries develop. This has been used as an argument against the toothbrush by the "back-to-nature" enthusiasts, but Mrs. Mellanby's recent work goes to show that it is diet which matters. Her husband, Professor Edward Mellanby, had previously shown the importance of vitamine D on all bone formation, including that of the jaws. Mrs. Mellanby takes this further in a series of experiments on dogs and shows that the whole condition of the teeth throughout life, *i.e.*, including the permanent set, may be considerably influenced by dietetic factors in early life and hence proper maternal feeding is of great importance. Indeed for a good set of teeth, say at sixty, it is necessary not so much to have had good tooth brushes but rather a good mother. ALAN MONCRIEFF

Letters to the Editor

County Health Units

To the Editor:

It is gratifying to observe that the proposal consistently advocated by the writer for the last ten years, *viz.*: that the Dominion Government should subsidize the establishment and permanent maintenance of whole-time health units in the provinces to the extent of one-third their cost, last month (March 3rd) received the unanimous support of the House of Commons in the passing of the following resolution, *viz.*:

"That in the opinion of this House, the Government should take into consideration the advisability of making grants to the Provinces equal to one-third the cost of establishing and to cover permanently such full-time health units as may be organized."

The Federal Government under the terms of the British North America Act is definitely committed to the support of health all over Canada. At Confederation those matters assigned to the jurisdiction of the provinces were definitely mentioned; those left undesignated fell within the jurisdiction of the Dominion. Health, not being mentioned at all in the Act, automatically became the subject of administration by the Dominion, and should receive federal support since the matter of local administration can best be operated by local agencies. This principle is well sustained in law; it has the support of eminent legal opinion. Whole-time local health administration, so greatly needed all over the country, is the earliest and most effective step in general public health advancement. The local units should embrace larger areas than the municipality except in the case of larger centres of population. In the rural areas the new health units might properly include a county or half a county, and the necessary funds should be the joint contribution of the three elements of government involved, *viz.*, Dominion, Province, and Municipality or new local area.

When this is accomplished a fine forward step in the protection of the health of our people will have been gained.

JOHN H. S. MCCULLOUGH, M.D., D.P.H.,
Chief Inspector of Health.

Toronto, March 4, 1930.

Narcotic Addiction in Canada

To the Editor:

I see by the *Canadian Medical Journal* that you are interesting yourself in the question of narcotic addicts. Have you ever thought of this idea, based on the Ontario Liquor Control Act and the practice of Japan in dealing with the question in Formosa?

1. Every narcotic addict to be given a licence, to be issued by the Provincial Government.
2. Addiction to be certified to by the Provincial Board of Health or the Medical Health Officer of the locality in which the addict resides.
3. No licence to be issued to a minor, or to a non-addict.
4. Every licencee to be given a book in which shall be placed his name, address, age, photograph, or finger print.
5. In this book shall be stated the minimum amount of narcotic on which the addict can get along. Legislate that the maximum amount shall be two days' supply. Have drug, amount, price and date of purchase endorsed in this book. Have similar entry made in the book of the Government vendor.

Along with the certificate that the man is an addict let the Board of Health say what is the maximum amount to be given for one day or at any one time.

6. Deal with the bootlegger in narcotics even more severely than at present.

Time cures the evil, not the doctor. These patients die off. Prevent others getting the drug.

Truly yours, JAMES MACCALLUM.

Toronto, March 6th, 1930.

Medico-Legal

Jarvis vs. The International Nickel Company of Canada, Limited

The judgment of Mr. Justice Wright in the recent case of Jarvis *vs.* International Nickel Company, Limited, in the Supreme Court of Ontario, may prove of interest to our medical readers. The plaintiff, an employee of the International Nickel Company, and being thereby entitled to medical care and attention, was operated upon by the Chief Surgeon of the Company for appendicitis. During the convalescent period he manifested an aural discharge which developed into a mastoiditis, although the early symptoms were very misleading. About three weeks after the appearance of the aural discharge, the patient was removed to another hospital where an operation by another surgeon revealed a mastoid condition. Since then, the patient claims to have made but a partial recovery. Suit was brought by the plaintiff against the defendant company upon a contract whereby the defendant company agreed to furnish him with medical and surgical treatment.

In summing up the case, it was pointed out that the defendant company only undertook to provide competent physicians and surgeons, but did not warrant that in all details of treatment these physicians and surgeons would exercise reasonable care and skill. Finding that the company had exercised due care in the selection of its medical staff, the action against the company was dismissed.

In considering the charge of negligence against the defendant Chief Surgeon, in that, firstly, he was negligent in not diagnosing the mastoid trouble and, secondly, that he did not call in an aural specialist, it was brought out by expert witnesses and accepted by the Court that there was no evidence that a medical man in the position of the defendant ought to have been able to diagnose the disease in its early stages. In quoting Halsbury's Laws of England, his Lordship stated "that all the practitioner is required to bring to the performance of his duty is reasonable care and average skill and that he is not responsible because some other practitioner of greater skill and greater knowledge might have prescribed a different treatment". "Furthermore, however regrettable it is in the present case that the disease was not diagnosed at a much earlier date and an operation performed then, it has not been clearly established that in such event, the troubles which resulted from the disease and the operation would have been prevented. It has not been clearly established that any of the troubles under which the plaintiff suffers were caused by the delay in the operation. That, in itself, would be a complete defence to the plaintiff's claim."

With reference to the charge that the defendant should have called in a specialist, the Court "failed to find in any of the authorities any support for the proposition that if a physician in charge of a case is unable to diagnose the trouble, he is under legal obligation to so advise the patient and to advise the calling in of a specialist."

However, his Lordship did think that it would have been more prudent to have called in a consultant rather than state that there was no mastoid trouble when the surgeon was unable to say what the real trouble was. Such a course ought not to have been humiliating to a physician of his standing. It was ruled that the evidence failed to establish actionable liability on the part of the defendant and the plaintiff's action was dismissed without costs.

The defence in this case was directed by the Canadian Medical Protective Association.

Vasoligature Deemed Assault

A short time ago there was a very remarkable trial in Graz, the second university city of Austria. A surgeon of good reputation was accused of causing bodily harm to a large number of men by performing on them an operation which, as the court believed, had the effect of sterilizing them permanently. It appeared that a prisoner, when examined before starting a term of hard labour, showed on his scrotum scars from an operation which he explained he had had done with the object of becoming sterile. In his native town, he said, a large number of men had applied to a surgeon named Schmerz for the same purpose, and had obtained the desired result. In the course of the proceedings it was stated that more than 700 men had been operated upon by Dr. Schmerz in the last two years. The court regarded this wholesale sterilization as a danger to public welfare, and although the accused said that his operation was only a temporary sterilization and could (so to speak) be undone at any time, and that he always took care to operate only in cases where definite social or medical indications were present, he was found guilty of gross offence. In vain the witnesses and medical experts whom he called gave their evidence for him. In vain it was asserted that the method was perfectly free from any danger in the hands of this excellent surgeon, and that in view of the frequency and

danger of abortion vasoligature was desirable where prevention of issue was necessary. Despite these pleas, the learned judge found the doctor guilty, and as he could not deal with the offence under any other heading, he turned to an old law of 1858 which applies to injuries inflicted by assault or attack, and sentenced the accused to a fine of 15,000 Austrian shillings (about £450) or two weeks' imprisonment. Naturally this sentence will not be left without appeal. Public opinion has been seriously disturbed, and comments, both professional and lay, are not very complimentary to this way of administering law. It must be added that a certain number of medical men disapprove of Dr. Schmerz's procedure, and hold that the judge's opinion was correct. At any rate, the case will be brought once more before a jury, for otherwise every surgical interference might be regarded in the same light, and every surgeon would run the risk of heavy fines for fulfilling his professional duties. — Vienna letter, *The Lancet* **2**: 1281, Dec. 14, 1929.

Topics of Current Interest

Clinical Results with Œstrin

The progress made during the last few years in the study of the hormones of the ovary has recently been described in our columns. A longer survey has been made by Dr. A. S. Parkes.[1] The reason for the rapid advance is the development of methods of biological assay on the one hand and of preparation and purification on the other, until at the present time it is possible to prepare very potent extracts from ovaries and placenta. To these sources must now be added the urine of pregnant women, a particularly rich source of the hormone. Not all material from these sources is active and it is therefore of the utmost importance that all clinical trials with these extracts of the ovary and placenta should be carried out upon biologically standardised preparations. The most definite and certain property of these extracts is their action upon the ovariectomised animal, particularly the mouse and rat, discovered by Allen and Doisy a few years ago. To ascertain whether any particular extract is active and to determine its potency, it is only necessary to observe whether it will restore the sexual cycle in the ovariectomised animal and to discover what dose is necessary to bring about this result. The discredit attached to ovarian therapy in the past was due to ignorance of a reliable method of testing the activity of the preparations employed. Whether the use of standardised preparations will restore faith in this method of treatment depends on clinical results, which are not easy to assess. Mr. Wilfrid Shaw[2] in this country and Dr. E. L. Sevringham and Dr. J. S. Evans[3] in America have been trying respectively the oily and water-soluble preparations on a group of cases and have published their experiences, which are encouraging though not conclusive. This is not surprising, for there is little analogy between the œstrus of the laboratory rodents, coincident as it is with the period of sexual activity, and menstruation in man and the higher primates; the difference is held to be connected at least in part with the functions of the corpus luteum. It is clear that in those patients in whom the deficiency, whilst it may be hormonal, is not primarily one of the œstrus-producing hormone of the ovary no effect can be anticipated. Moreover, the problem of dosage is not yet solved. If the correct dose is proportional to the body-weight, a woman with complete ovarian deficiency will require a dose of some 1,500 rat units, an almost impracticable quantity. With the small doses available at present too much must not be expected. The distribution of the dose, however, can be controlled. The preparations used are of two kinds: oily and water-soluble. The earlier oily preparations suffer from the disadvantage that they are liable to give pain on injection, and Shaw refers to the severity of the local reaction produced. The fact that they are slowly absorbed, however, may be an advantage, since the effect of the dose is spread over an appreciable time. In animals a single injection of the aqueous preparation is much less effective than that of the same total amount of material given at frequent intervals. Aqueous preparations such as those used by Sevringham and Evans are not followed by any local reaction, but they have to be given frequently, probably daily, to get the best results.

The hysterical tendencies associated with some of the conditions studied tend to increase the difficulties of the clinical work. In view of the fact that one of the most striking properties of œstrin is its action in promoting uterine growth in experimental animals Mr. Shaw examined the effect of the hormone in 15 cases of spasmodic dysmenorrhœa, with the typical

1. Internal Secretions of the Ovary, London, Longmans, Green, & Co., 1929.
2. SHAW, WILFRID, Observations on the therapeutic value of the œstrus-producing hormone of the ovary, *Quart. J. Pharmacy & Pharmacol.* **2**: 373, 1929.
3. SEVRINGHAM, ELMER L., AND EVANS, JOSEPH S., Clinical observations on use of an ovarian hormone, Amniotin, *Am. J. M. Sc.* **93**: 638, November, 1929.

ill-developed uterus associated with this condition. In six of these no improvement was observed, even when 50 units were given at weekly intervals; all were severe cases. In nine others the treatment was successful either in completely freeing the patients from pain or in alleviating it. The size of the uterus, however was increased only in two cases and in all the symptoms returned when the injections were stopped. The author recommends trial of the treatment in young women and where dilatation of the cervix is not successful. Not all cases respond, and if after eight weeks there is no improvement the injections should be discontinued. In five cases of primary amenorrhœa no definite effect was observed and menstruation was not established in any of the subjects. Two cases of amenorrhœa of secondary type also gave negative results. Both of these were combined with adiposity, and in each of six further patients who were not adipose menstruation followed the administration of œstrin. The results indicate that the treatment may be of value when the symptoms are of recent date. Other cases in which good results have been observed include women with irregular menstrual periods. According to Sevringham and Evans, relief is also given in menopausal disturbances, particularly those associated with vasomotor phenomena, in which good results are reported in 10 or 11 out of 15 cases treated. Both the English and American investigators refer to the handicap of the lack of an objective index of ovarian activity in the human subject, a circumstance which together with the spontaneous improvement well known to occur in young patients, makes the scientific evaluation of any drug extremely difficult. The workers themselves consider the results obtained to be in many ways encouraging.—*The Lancet* **2**: 1372, Dec. 28, 1929.

Milk Versus Cod-Liver Oil

In the Danish journal *Ugeskrift for Laeger* (October 3, 1929, p. 852), H. R. Krogsgaard describes an investigation he carried out on the relative value of milk and cod-liver oil to growing children. The subjects of the investigation, boys living under the same conditions in a school in Denmark, were divided into three groups, of which the first, containing thirty-four boys, received a daily extra ration of 9 oz. of fresh milk, the second, containing thirty-three boys, served as control, and the third, containing eighteen boys, received a daily extra ration of a tablespoonful of cod-liver oil. The experiment was started on March 1st and ended on June 4th. Once a month the boys were weighed and measured for height, and the permanence of the results was checked by measurements taken on June 30th. In the first month the milk group forged ahead rapidly, with an average gain in weight of 7 lb. 5 oz., in contrast with the control group and the cod-liver oil group, whose average gain was only 1 lb. 1½ oz. and 12 oz. respectively. But on June 4th the differences were not so marked; the milk group failed to sustain its initial spurt, and its average gain was now only 2 lb. 6 oz.; of the control group it was 3½ oz., and of the cod-liver oil group it was 7 oz. On June 30th, when the permanence of the result was tested, it was found that the differences in the three classes had been almost wiped out, the average gain of weight over the whole period for the three groups being respectively 1 lb. 1½ oz., 12 oz., and 14 oz. In respect of increased height the cod-liver oil group proved, in the long run, to be better than the milk group. During the actual period of the experiment the average increase in the milk group was 0.5 inch, and by June 30th it had reached nearly 0.6 inch. In the control group the corresponding figures were 0.3 inch and 0.7 inch, and in the cod-liver oil group they were 0.1 inch and 0.8 inch. The surprising fact was that the cod-liver oil group, which had at first lagged behind the others, eventually beat them both. Krogsgaard's expectation that the underweight children in the cod-liver oil and milk groups would show the greatest gains was not fulfilled. In the cod-liver oil group there were ten children who were 7 per cent under weight in relation to their height; at the end of the experiment they were 8.4 per cent under weight. In the milk group there were also ten underweight children; their average underweight in relation to height before the experiment was 9 per cent, and at the end of the experiment this figure was reduced to 7.5 per cent. It would seem that whereas the boys in the cod-liver oil group had developed in height rather than in weight, those in the milk group had spent their extra ration in growing heavier rather than taller. In respect of absences from school because of sickness the cod-liver oil group did best, the figure arrived at by dividing the number of days of sickness by the number of children being in this group 0.57, in the control group 2.62, and in the milk group 2.10. It was only during the period of the experiment that the three classes showed these striking differences in sickness rate. Krogsgaard concludes that the addition of milk to the dietary of school children of average weight brings about only a temporary gain of weight, and none at all in underweight children. Cod-liver oil, he suggests, not only promotes gain of height, but also a reduction of the sickness rate.—*Brit. M. J.* **1**: 79, Jan. 11, 1930.

Medicines in the Mass

It is recorded that one, Samuel Jessop, who died at the age of 65, in the year 1817, had such an inordinate craving for physic that in 21 years he took no less than 226,934 pills, besides 40,000 bottles of mixture; and in 1814, when his appetite increased, his consumption of pills was 51,590. "Truly," says William Ward in whose quaint memoirs we find this remarkable story, "he must have thought with the prophet, 'The Lord hath created medicines out of the earth, and he that is wise will not abhor them'." In the absence of evidence to the contrary it may be assumed that the late Mr. Jessop holds the record as a pill swallower, but there were others who ran him pretty close as, for instance, David Hartley, who ate 200 lb. weight of soap, and a certain bishop who drank a butt of tar water. From all this it seems clear that the Englishman's fondness for medicines is no new thing, but rather is a tradition that has been handed down from father to son. And so, as Steele observed, there arise in one generation after another quacks and those that are their prey. More than 100 years ago England was called the "paradise of quacks," and the title still has its claim. In the nature of things there is, of course, a difference between the nostrum monger of to-day and his prototype of old, for this is an age of mass production, while the other was an age when output was limited to the capacity of a man's hand. But in spite of, or because of, mass education, the credulity of the public is unchanged and unchanging. There is probably as much money spent on teaching the people that quack medicines are good for them as on any other single purpose, and so long as the nostrum industry is allowed to say what it likes, and the newspaper industry is allowed to print what is said, quackery will continue to flourish.

It is a deplorable fact that public opinion is not against secret remedies; but so much money is being spent on educating the public to believe in them, that the public intelligence is perverted. We have made some progress, it is true, to arrest the evil. For instance, no Government in our time has engaged in the quack medicine business; this is a step forward, for in times past governments have paid large sums for the purchase of nostrums. Thus in 1739, the House of Commons voted £5000 to Joanna Stevens for a solvent to remove stone, notwithstanding which, said a writer 90 years later, "there have been as many human calculi, since formed by His Majesty's liege lithotomical subjects, as would macadamise one side of Lincoln's Inn Fields." Incidentally, it was David Hartley, the soap fiend, who was instrumental in obtaining this grant for Mrs. Stevens, and it is sad to reflect that he himself died of the stone. The Parliament of England went out of the quack medicine business many years ago, and the moral outlook has been improved to that extent; but it is humiliating to have to admit that beyond ceasing to encourage quackery no Government in this country has done anything to discourage our Jessops or to protect medicine-taking dupes from medicine-making pretenders. Let us make our position quite clear. We do not condemn proprietary medicines en bloc, while we deplore the license enjoyed by the vendors of worthless remedies. Here we feel it to be our duty to point to the need which exists for some restraint on the zeal of those engaged in the traffic. Just before the war there was a Bill before Parliament which aimed at the prevention of some of the abuses which are part and parcel of this unwholesome business, and there were good prospects of the measure passing into law, notwithstanding the several vested interests which it affected. The Bill was based upon the recommendations of a Royal Commission and by its main provisions it sought to prevent the sale and advertisement of "cures" for incurable diseases, and to prohibit the making of unjust claims as to what a secret remedy could do. It attacked only the obviously fraudulent side of the industry, and left open for exploitation by drug makers, enthusiastic for their own preparations —an even wider field than is available for cultivation in any other civilized country. We would that the present Government, despite its obvious lack of time in which to meet its commitments, would take this Bill out of its pigeon-hole and at least give it an airing. No honest man would stand to lose anything if it became law, and no hypochondriac would be stinted unduly in the practice of his hobby. The secret remedy evil is rapidly increasing in this country because ours is the only nation which does nothing to check it. Profits are being made among us by aliens through methods which if employed in the land of their birth would render them liable to segregation as enemies to society. This is a preposterous state of affairs. Mass production, big newspaper circulations, and ever-widening of the channels of distribution are continuing to spread the evil to such an extent that it may soon become a national vested interest, and as such be almost impossible to destroy. Our staple industries are in a bad way, unemployment and shortage of money are acute; and yet the turnover of quack medicines is bigger than ever it was, and many people are spending on rubbish what they ought to be spending on food. Our administrators should look into this matter; the spade work has already been done, and, as we have said, the appropriate minister will find waiting in his department a considered measure which if passed into law would afford some protection for the ignorant and quell an abuse which humiliates this country in the eyes of the world. —*The Lancet* **1**: 194, Jan. 25, 1930.

Motion Pictures for Medical Instruction

The value of motion pictures for medical instruction is gradually becoming more appreciated. For the student they can never replace experience gained from personal contact with disease, nor can they supplant the present well established methods of teaching medicine, but as an adjunct to the methods in vogue at present, by facilitating the instruction, conserving the time of instructors and students, and by economy of materials, they are of inestimable value. Naturally such statements presuppose high grade production. Accuracy as to scientific detail, good cinematographic technique, and the best of photographic quality are primary requisites. With these qualities incorporated motion pictures acquire considerable value in all branches of medical science.

For the medical student and the post-graduate student motion pictures produced primarily for lecture purposes can be used with the greatest success. They have the advantage over the usual lectures that innumerable repetitions are possible, permitting the student to study the subject until he has acquired a thorough understanding of the facts presented. Furthermore, most of us are visually minded, with the result that by this method of presentation the subject matter can be digested and assimilated more rapidly.

From the surgical standpoint, the motion picture can bring to the student and profession at large the work of the outstanding surgeons. Every one will admit the limitations of the motion picture for operative demonstration, and no one will presume to claim that surgery, as such, can be taught by motion pictures, but motion pictures of certain operations, carefully selected with regard to their adaptability to photography, can demonstrate successfully many of the fundamentals of surgical technique as practised by leading surgeons. Comparison of differences in the details and mechanics involved can serve as an introduction to the beginner, and leads to a broader and more comprehensive understanding of the subject for the more advanced student. By this method the best work can be available to all at present and in the future, and aside from purely historical and sentimental considerations, such records will have a very practical value for posterity.

For physiological and pathological demonstrations, the motion picture is most practical. An experiment once satisfactorily performed and photographed endures for all time, making further repetition unnecessary. Motion pictures of such experiments present the essential features in a minimal amount of time, and, for instructional purposes, eliminate the uncertainty coincident with any experimental demonstration. Without any preliminary laboratory preparation students can see the experiment at any time and, as often as desired, study it to their utmost satisfaction. These features are a distinct advantage to the student as well as the instructor. In addition there results a tremendous economy in time and material. By the skilful use of carefully prepared animated drawings many physiological processes and pathological reactions, not readily discernible, can be graphically shown. Many of the more delicate reactions, demonstrable only to individuals or small groups with the greatest difficulty, can be readily shown and easily understood. Phases of this work which do not lend themselves well to actual photography can also be presented by such drawings, making the subject complete in all details.

In microscopic work for instruction and research purposes, microcinematography has unlimited possibilities. The introduction of the microscope opened vast unknown fields to exploration. The moving picture camera, applied to the eye piece of the microscope, advances such exploration by making possible a study and analysis of the motion of microscopic life. By the stop motion camera, or the popularly known slow motion picture, the development, growth, and life processes of microscopic life can be photographed and studied. Whereas formerly the scientist spent hours and days constantly at the microscope to describe phenomena occurring on the microscope stage, the motion picture camera, with suitable mechanical devices, can not only see the processes as they occur, but gives a permanent record which all can see, a record available for all time. The value of such an advance in the field of research can readily be appreciated. For the investigator many tedious hours at the microscope are eliminated. There results an increased accuracy of results due to minimizing the human element, always subject to error. The investigator can repeat his experiment before his own eyes and the eyes of others innumerable times without all the difficulties of actually repeating the experiment. There is available a permanent record. For the student such records present facts which formerly he could not visualize except through his imagination, stimulated by lengthy descriptions. As applied to bacteriology, parasitology, embryology, and allied subjects, such films may be considered treasures.

Appreciating the value of motion pictures for medical instruction, whether for the student or post-graduate, Eastman Teaching Films, Inc., Rochester, N.Y., in collaboration with the American College of Surgeons, has undertaken productions along the lines described. Im-

proved technique, improvement of subject content, and careful scientific supervision combine to make these films pre-eminent in the field of medical motion pictures.

The films already prepared deal with the following subjects: Diagnosis and treatment of infections of the hand (3 reels); Intestinal peristalsis; Simple goitre; Benign prostatic hypertrophy; Indirect inguinal hernia (3 reels); The technique of blood transfusion; Rabies; The ectopic heart. These films may be rented or bought outright. On the rental plan the prices vary from $3.75 to $40.00, according to size and subject of the film, and for actual purchase from $25.00 to $275.00.

Deeming's Skull

It has long been known that Deeming was a small-headed low grade ament, with a sadly under-developed brain of control over his sexual and criminalistic passions, and a head so small that it would have disgraced a normal 13-year-old-schoolboy. Unhappily there are hundreds of similar microcephalic idiots in the many institutions in this and other countries, and even more outside, taking their daily toll from human society in the form of crime and disorder. Modern students of the wonders and imperfections of the human brain have also long been aware that the McNaughten decision of 1843 as a conception of insanity is out of date, but both the law and society are confronted with the serious problem of "responsibility."

We might, especially in view of more modern knowledge, revise our conceptions of insanity. The human intellect is the only thing which distinguishes man from the lower animals, and it is but a tender plant. We are born into the world with the mentality of the idiot and the imbecile, and we go out of it, if we live long enough, as senile dements. Insanity is therefore a concomitant of life itself. It is surely a matter of common knowledge that the reproductive cells of the human body have a much shorter life than the cells of the body generally, and so it is with the brain cells. In many individuals brain cells have an even shorter life than either the sex or the bodily ones. Clearly, therefore, insanity is not, in many cases, so much a disease as an error of development.

Scientifically, there is hope for the future, because we are slowly but surely solving the problems of the phenomena of mind from an intensive study of the minute structure of the human brain, and have at last reached the stage when the potentialities of the child can be fairly accurately prognosticated, and the juvenile criminal "spotted" in advance. But so long as we continue to ignore the imperative necessity in brain breeding of good breeding, so long shall we continue to have these defective brains among us, and so shall we continue to confuse the spurious "insanities" with the real developmental amentias, of which Deeming and many another criminal are but examples.—Dr. Richard J. A. Berry in the *Weekly Times*.

The Medical Research Council and Good English

The lot of the writer of monographs is a hard one, for he must have done some hard thinking, and it is not made easier by the Medical Research Council which, in our view, imposes upon him salutary rules inspired by wisdom and experience. He is advised not to commence an article, he must begin it. He cannot have been engaged in a study of his subject; he has just studied it. He should not write in conjunction with a friend; but just with him. And he should not collect a considerable amount of material or a considerable number of facts, he should only collect much or many of them. In short, restrictions of liberty have been suggested, so that his manuscript will undergo a 20 per cent reduction (or, as one might say, be one-fifth shorter) and eventually he may find himself writing quite good English without the help of the Publications Department of the Council. In the Notes upon the Preparation of Reports for Publication, which have just been issued in a revised edition after an interval of nearly nine years, the advice remains substantially the same except for the addition of two useful appendices: one of shorter and better equivalents for long words or phrases, the other a list of abbreviations of the names of journals taken from the World List of Scientific Periodicals prepared under the direction of the Keeper of the Department of Printed Books in the British Museum. The Notes have not been placed upon sale, but have been widely distributed among research workers in medicine. The advice is not oppressive or cramping to an author's style; by surrendering his liberty in non-essentials he will gain the freedom in essentials which really matters. The Notes are free from the touch of irony or subtle malice which seems almost incumbent on those who desire to impose their own literary style on others. It was a wise author who admitted the many ways of writing tribal lays every single one of which was right. The Council's censor has refrained from such banal quips as advising a would-be author to add a bibliography to his paper rather than a list of references and never to write the patient died but to say he ceased or "exitus lethalis." He might have said: If you feel the urge to write a medical article do

not restrain yourself merely because you have nothing new to say and hardly know how to say it; facts and theories in medicine must be repeated again and again to drive them home. It is this sort of advice that estranges the earnest young writer and puts him off his stride when a more sympathetic mentor would be helpful in setting his feet on the narrow path of successful authorship.

Comparison of the Notes of 1929 with those of 1921 reveals one alteration for which we are profoundly grateful. In counselling the avoidance of obscure and misleading abbreviations the Publications Department has now fallen in with the continental practice of using the single letter g as an abbreviation for the gram when standing alone or in its various compounds (kg., cg., mg.). Owing to the unfortunate similarity of the abbreviations used for the words gram and grain these words should always be spelt in full if there is any possibility of doubt as to which unit is specified, but the Council has seen the wisdom of adopting the symbol g. for the gram which is slowly but surely taking its place as the unit of weight throughout the civilized world. Rather singularly in doing so the Council has gone back on its abbreviation for cubic centimetre, which in 1921 was given as c.cm. and is now c.c., an exception to the rule made, it is stated, in order to conform with the general practice. But here, again, we feel that to make the exception is to introduce disorder into the very heart of exactitude. No doubt to those who are brought up in chemical laboratories a hundred-see-see measure or a ten-see-see bottle has become a habit of mind; to the chemist the see-see is the only unit, and the exception scarcely matters, but the biochemist has to do as much or more with the cubic millimetre, with its orthodox abbreviation. There can surely be no hardship or ambiguity in writing c.cm. and we trust that in this particular writers of monographs will assert their individual judgment against that of the Medical Research Council.—*The Lancet* 2: 1320, Dec. 21, 1929.

Abstracts from Current Literature

MEDICINE

Some Modern Aspects on Cholecystitis and Cholelithiasis. Walton, W. J., *The Lancet* 1: 334, Feb. 15, 1930.

The writer discusses the formation of gallstones and believes that the majority are due to an inflammatory process, except probably the cholesterol and pigment stones. The cholesterol stones are always formed in the gall bladder. The pigment calcium stones are often formed in the ducts. Calculi found at birth or in very young children are always of pure pigment calcium and may be found in the absence of any inflammatory change. These are often seen in cases of acholuric jaundice, and will recur even though a cholecystectomy be done, so long as the spleen has not been removed. It seems thus that this variety of calculus may be formed owing to a metabolic error. These stones may be also formed as the result of infection, because true recurrent calculi in the common duct, occurring after cholecystectomy and due to the presence of cholangitis, are always formed of pigment calcium alone. All other calculi are due to a chronic inflammatory change. He does not agree with previous writers who have put pure cholesterol stones in the group of non-inflammatory origin. In 23 of his own cases of pure cholesterol stones 8 were associated with acute cholecystitis and 15 with chronic cholecystitis. Mr. Walton believes that the source of infection is either systemic or by lymph-drainage from the appendix, although he has never been satisfied that sufficient evidence has been brought forward of a really close relationship between appendicitis and cholecystitis. He believes that cholecystitis is a localization of a general infection.

Regarding the recurrence of calculi, Mr. Walton suggests that they form about a foreign body, such as a ligature, in instances where they recur after cholecystostomy. Calculi may actually form in the ducts, as evidenced by acholuric jaundice. He believes that the greater number are due to stones having been overlooked either in the bladder or ducts, or to a true reformation in the gall bladder. He cites 95 cases of common duct stones, 29 of which were unassociated with jaundice. In 28 cases of recurrence of stones 22 occurred in the gall bladder after cholecystostomy. Of these four took place in a total of 51 cholecystostomies which he had performed himself. This is a recurrence rate of 6 per cent. That the continuance of symptoms following cholecystectomy is due to an associated chronic gastritis is evidenced by the absence of free acid in the stomach, and this may be a relic of the original general infection.

In the operative findings he does not place as much credence on the fibrosis of the adjacent liver as an evidence of cholecystitis, as some other writers do.

Mr. Walton, also believes that there is some danger in too much reliance being placed on cholecystography. He claims that four variable factors affect the final result in cholecysto-

graphy, an error in any one of these steps leading to the absence of a normal shadow. He is confident that to-day there are far too many gall bladders being operated upon, simply because there is an absence of the normal shadow, or because the gall bladder shows irregularity in outline. Regarding treatment he feels that a medical treatment regime should always be tried in the very mild cases. He doubts the efficacy of medical treatment in the so-called "strawberry" gall bladder, and recommends cholecystectomy for all cases showing calculi. He has a series of 574 cases as against 1,277 peptic ulcers in the same length of time. He does not publish results.

W. L. GRAHAM

The Treatment of Idiopathic Epilepsy by the Intraspinal Injection of Bromides. Scheimann, A. I., *Kasankij Medizinskij Zurnal* **25**: 4, 1920.

Hoping to obtain a better therapeutic effect from bromides than is usual, Scheimann introduced the drug by intraspinal injection in 25 patients. There were 22 males and 3 females, from eight to thirty years of age, in his series, and they were having one or more seizures a day. The procedure consisted in the injection between the fourth and fifth lumbar vertebræ of from 5 to 10 c.c. of a 5 to 10 per cent solution of sodium bromide once a week. Previously to the injection a quantity of the cerebrospinal fluid, double that of the solution to be injected was drawn off. Six injections in all were given; the first two were of 5 c.c.; the third and fourth were of 7.5 c.cm.; and the fifth and sixth were of 10 c.c.

As a rule the drug was well borne. Only in four cases a slight meningismus was noted three or four days after the injection. Three patients appeared to be freed of their attacks; the remainder were improved, in that the number and intensity of their attacks were lessened. One patient with status epilepticus was not benefited.

A. G. NICHOLLS

Dauerschutz gegen Blattern (Beobachtung bei 300,000 Revakzinationen). The Duration of Immunization against Small-pox (Observation on 300,000 cases of Revaccination). Fronz, E., *Wiener med. Wchnschr.* **79**: No. 28, 1929.

In the year 1907 small-pox seemed likely to become epidemic in certain parts of Austria and everybody was revaccinated. The author of this article sent out a questionnaire to the physicians of the district concerned regarding certain important and interesting questions involved in the matter of revaccination. He draws the following conclusions from the information he received. Protective inoculation may, of course, produce more lasting effects when revaccination is practised. On repeated inoculation the reaction becomes steadily weaker. A period of ten years between reinoculations is all that is required. No untoward results followed revaccination, except that a fleeting exacerbation of inflammatory processes may be lighted up. In 300 revaccinations no case of encephalitis was observed. Revaccination seemed to exert a favourable influence in many cases of whooping-cough.

A. G. NICHOLLS

Additional Cases of Acute Hemolytic Infectious Anemia. Lederer, M., *Am. J. M. Sc.* **179**: 228, Feb. 1930.

Lederer reports three additional cases of acute infectious hæmolytic anæmia, bringing the total number recorded in the literature to 12. The disease was first described by him in 1925. A majority of the cases have been of the male sex. The onset is characterized by the rapid development of anæmia of the icteroid type, weakness, fever, and sometimes hæmoglobinuria. One-third of the reported cases have had enlargement of the liver and spleen. The classical evidences of hæmolysis, namely bilirubinæmia and urobilinuria have been present in all cases. The blood picture is described as a profound anæmia with a high icterus index, leucocytosis and erythroblastæmia, that is, many nucleated red cells. Emphasis is laid upon the presence of megaloblasts. The platelets are normal in number. In one case where the fragility of the erythrocytes was estimated, it was normal. In none of the cases did the history or the examination reveal any cause for the hæmolysis.

The treatment consists in transfusion which promptly brings about a cessation of the hæmolytic process. Liver and liver extract have been tried without success.

E. S. MILLS

Erythroblastemia of Infants (von Jaksch's Disease). Witcher, B. R., *Am. J. M. Sc.* **179**: 236, Feb. 1930.

Witcher reports three cases considered by him to be instances of erythroblastæmia of infants, or von Jaksch's disease. This is a disease of nursing infants characterized by a deficiency of the blood in hæmoglobin and erythrocytes, by marked anisocytosis and poikilocystosis of the cells, by the presence of numerous nucleated red cells, a persistent increase in lymphocytes, and, finally, enlargement of the liver and spleen. Witcher's three cases were males of nine months, five and a half months, and six months respectively. The development of the disease was slow and

insidious in all three cases. The spleen was enormously enlarged and the liver moderately so. Signs of latent rickets were present. The blood showed an anæmia of grave proportions. The initial leucocyte counts were 19,800, 50,000 and 23,000 per c.mm., with 54, 73, and 60 per cent of these lymphocytes and mononuclears. The most striking feature of the blood was the abundance of nucleated red cells, and particularly of microblasts and normoblasts, though megaloblasts were also present. The total number of these nucleated forms was frequently equal to the number of leucocytes. Platelet values are not mentioned. The disease terminated fatally in each case, and although there were apparently no necropsies, the author feels justified in considering the cases instances of a "sub-group" of von Jaksch's disease.

E. S. MILLS

Ueber hereditären hämorrhagischen Diathesen. (On hereditary hæmorrhagic diatheses). Rosling, E., *Acta Med. Scand.* **72**: 104, 1929.

This group of cases, showing as it does symptoms that partake of the nature of both hæmophilia and purpura hæmorrhagica, is very interesting because it probably gives a clue to those cases of so-called hæmophilia in the female. In Rosling's family, the grandmother, 3 of her 5 daughters, and 2 of her granddaughters exhibited the hæmorrhagic tendency. It might at once be assumed that only females were affected with this syndrome, but a glance at Rosling's pedigree shows that there were only 2 males in the second generation and 1 in the third, so that it is not indicative of any peculiar affinity for the female sex that in 3 generations, 6 females were affected. Laboratory methods showed that the blood platelets were normal (indicative of hæmophilia), the clotting time was normal, and the bleeding time was prolonged, both indicative of a thrombocytopenic purpura.

Comment of the reviewer. — Many instances of these border line cases of hæmorrhagic diatheses have been reported, and the fact that the findings partake of those of purpura as well as of hæmophilia shows that in the case of hæmorrhagic tendencies the diagnosis should be made only after a complete laboratory investigation of the number of platelets, the coagulation time, the bleeding time, the retractility of the clot, and the history of joint hæmorrhages, purpuric spots, etc. Such care in the diagnosis would not only prevent errors of judgment but do much to help in the clarification and the correct classification of these hæmorrhagic diatheses.

MADGE THURLOW MACKLIN

Huntington's Chorea. Brown, E. C., *Bull. Vancouver M. Assn.* **5**: 135, 1929.

Quite an extensive pedigree covering four generations of a family afflicted with Huntington's chorea is reported by Brown. There were 123 persons in 4 generations, and of these, 30 were affected, 16 males and 14 females. If we exclude from this number 123 (all those members of the fourth generation most of whom were far too young as yet to have developed it), we find that we have 56 persons (there being 67 unaffected in the fourth generation, and 1 affected) of whom 30 showed the disease.

Now this affection is one which characteristically occurs in the offspring of persons who themselves were affected. It is possible that a person who would have developed chorea had he lived long enough transmitted the potentiality of developing the disease to his offspring but died before exhibiting it himself. There seems to be in this pedigree such an instance, for a woman of the second generation who was free from it had seven children none of whom were reported as developing it. The son of one of these however had chorea. From our knowledge of the transmission of this disease, it is quite certain that his mother and grandmother both would have developed the disease if they had lived long enough. With this one exception the direct mode of descent from parent to child is exemplified in this pedigree. Inasmuch as the disease is one which may not appear until middle life, no child of a parent who has had Huntington's chorea should feel justified in marrying. The probabilities that that child will develop the disease are too strong. For example, in the family of the second generation, 7 of 9 children showed it, and in the families of the third generation, some of the ratios are as follows: 3 affected to 1 normal; 6 to 1; 7 to 2; 5 to 1. Such figures should convince laity and profession alike that no one in a family in which a parent or brothers or sisters have shown this disease should marry.

MADGE THURLOW MACKLIN

Die Intravenöse Pyelographie (Intravenous Pyelography). Roseno, A. *Klin. Wchnschr.* **8**: 1165, June 18, 1929.

The author presents a diagnostic procedure, which, though not new in principle, embodies the use of a new compound which appears to have certain definite virtues. This compound is a combination of sodium iodide and urea. It is claimed that the urea not only renders the iodide non-toxic but also gives it a selective affinity for the kidney, which excretes it rapidly and in sufficient concentration to be opaque to the x-ray.

The compound is dissolved in 200 to 300 c.c. of saline and given slowly into a vein. Amounts

equivalent to 38 gm. of iodide have been given in this way without untoward effects. Pictures taken 15 minutes after the injection should visualize the renal pelvis, ureters and bladder, but they must be repeated at longer intervals, in order to determine delay in excretion or stasis. The bladder should be full of urine or should be filled with fluid at the beginning of the procedure, so that the urine will tend to be dammed back, and the renal pelves will thus be more completely filled.

The picture thus obtained gives one not only an outline of the entire urinary system, but also, by virtue of the fact that it is quantitatively excreted, it provides an index as to the absolute and relative functional ability of the two kidneys. The kidney parenchyma being impregnated with this opaque material is more clearly visualized than by other methods, and as the pelvis becomes filled it too is visualized. Several radiograms are shown which have been taken by this method in human subjects. A very complete picture of the kidneys, ureters, and bladder is obtained, and in this way the method has certain advantages. Though the kidney shadows are very well defined the renal pelves are not uniformly so well outlined as in the usual pyelogram. The pictures which are shown are however good, especially for a procedure which is still in its infancy.

Most of the work has been done on dogs, but enough human cases have been done to show the procedure to be a safe one. Iodide rashes have been noted, but no other reaction is mentioned. Thyroid disturbances and active pulmonary tuberculosis are the only contra-indications mentioned.

N. E. BERRY

SURGERY

The Protective Rôle of the Liver in Abdominal Surgery. Heyd, C. G., *Am. J. Obst. & Gyn.* 19: 203, Feb. 1930.

In any laparotomy, with or without exposure of the liver, there are a great many possible physical, chemical, infectious, mechanical, and toxæmic traumata, plus possible leakage from drainage, plus varying degrees of dehydration. The sum total may often prove fatal to the patient with depressed or impaired liver competency. A significant group of deaths is not due to anatomical causes, infection, overwhelming intoxication of high intestinal obstruction, or perforation. The clinical manifestations of these cases suggest that the death is in large measure due to liver failure or to insufficiency of the protective function usually exercised by the liver.

The liver is notoriously able to control infections and catabolic proteins, the result of infections. If the dosage of these bodies is overwhelming, or their toxicity beyond the detoxifying power of the liver, the liver fails to give protection.

In the presence of persistent vomiting after laparotomy recourse should be had to blood chemistry determinations. Increase in urea nitrogen, decrease in chloride, and increased carbon dioxide combining power indicate alkalosis as the probable diagnosis. Remedial measures should be adopted before the urine begins to show marked evidence of renal damage. Treatment consists of administration of normal saline and glucose through all channels and the giving of acid phosphate solution by mouth or per rectum, the securing of gastric rest by a Levine siphon tube, and jejunostomy if there is evidence of intestinal obstruction or marked jejunal reflex. It is essential to have repeated blood chemistry determinations to control or indicate further therapy. If symptoms of tetany appear, 5 c.c. of 10 per cent solution of calcium chloride are given intravenously and repeated when necessary.

ROSS MITCHELL

Surgical Treatment of Carcinoma of the Cervix. Bonney, V., *The Lancet* 1: Feb. 1930.

Mr. Bonney gives an interesting summary of his personal experience with the Wertheim operation for carcinoma of the cervix. Over a period of 17 years he did 382 of these operations of which 284 were followed cases. He reports a mortality of 16.5 per cent in this series, with 39 per cent of five-year cures, excluding those patients who died from other diseases.

He reports in each series of 100 cases a mortality rate of 20 for the first 100, 14 for the second and 8 for the third, stressing thereby the necessity of experience in handling this type of treatment. He describes in detail the technique of the operation. He concludes that 63 per cent of cases in hospital practice are operable when seen, and 80 per cent in private cases; that 68 per cent of all recurrences occur before the end of the second year, and 90 per cent before the end of the fifth year.

His remarks on radiation as an adjunct to surgery are most interesting. Practically none of his patients received radiation before the operation. Of the few that did, with a view to making the growth operable, all have died, either as the result of the operation or from rapid recurrence afterwards. He believes that the possible good results of radium therapy are nullified if there is a subsequent operation.

In his report 29 per cent of the patients had a ten-year cure. He believes that the future treatment of carcinoma of the cervix should be operative, and of the Wertheim type, as neither radium nor the usual supravaginal hysterectomy removes infected glands. Inoperable cases, he believes, should be treated by radium only.

W. L. GRAHAM

The Treatment of Epithelioma of the Tongue by Radium. Gask, G. E., *The Lancet* **1**: Feb. 1, 1930.

Professor Gask, in an Hunterian lecture, has given the views of the surgical unit of St. Bartholomew's Hospital on the treatment of cancer of the tongue. The results of surgical treatment of 70 cases showed that at the end of five years only 12, or 17.1 per cent, remained alive.

Mr. Gask dilates upon the radio-sensitivity of the various grades of malignancy and believes that grade I, *i.e.*, the one most approaching the normal tissue is more resistant to the effect of radium than the more malignant types, and he believes that the survival-rate is also related to the grading of the malignancy. He shows that at the end of three years grade I malignancy has a survival-rate of 36.4 per cent; grade II a survival rate of 18.2 per cent; grade III, a survival-rate of 8 per cent; and grade IV, 0. He quotes other published surgical results none of which show much better results than his figures. Reporting the results of radium treatment the figures from various sources do not show a marked increase in cures, the largest series of cases showing a three-year cure is 21.6 per cent.

He reports 30 cases treated by his service. He points out that by the use of radium one leaves a useful mobile organ; that the immediate mortality is in cases that have been classed as inoperable; and that the treatment of glands by radium needles has not been satisfactory. He believes that the best results in the treatment of the glands results from dissection of the glands followed by the use of a radium collar. He believes that the treatment of the primary tumour of the tongue by radium presents no great difficulty and the key to the complete cure of the patient lies in the effective treatment of the lymphatic area. The treatment is divided into three parts. First, when the glands are not clinically enlarged block dissection of the affected side is carried out, followed by histological examination. If the glands are affected a radium collar is applied. Second, when the glands are clinically enlarged block dissection is done on the affected side, followed by histological examination. If the glands are affected either the insertion of radium needles or the application of a radium collar is indicated. Third, when glands are enlarged, fixed, and inoperable, an attempt should be made to bring them to a stage of operability by the use of radium needles or a radium collar.

W. L. GRAHAM

The Use of Radium in the Treatment of Rectal Carcinoma. Lockhart-Mummery, J. P., *Brit. M. J.* **3603**: 139, Jan. 25, 1930.

Radium may be used in three ways in the treatment of rectal carcinoma: (1) as an adjunct to excision; (2) in inoperable cases; (3) as a substitute for operation.

The recognized treatment of carcinoma of the rectum, at present, is complete removal of the rectum and surrounding structures, with permanent colostomy. The author believes that in early and favourable cases local excision, plus the use of radium needles, will result in a good percentage of cures, and obviate a permanent colostomy. His method consists in excision of the coccyx with a portion of the sacrum, if necessary, division of the subjacent muscles, and freeing of the rectum. An opening into the latter is made to one side of the growth, which is then removed with about half an inch of surrounding healthy tissue. The opening is closed transversely. The divided muscles are sewn so as to support the first line of suture. Radium needles are now placed (a) in the mesorectum as high as possible; (b) along the line of lymphatic spread; (c) on each side of the rectum; (d) in all neighbouring tissues where spread might be possible. Threads attached to the needles are left in the wound which is closed except for a small drain. Drainage of the rectum is obtained through a tube in the anal canal. No colostomy is done. After one week the wound is reopened, the needles removed, and free drainage provided. Local recurrence, as seen in one case, may be treated with radon seeds.

It is not advisable to treat an operable case by radium alone. If colostomy is refused, or the radical operation inadvisable because of age or infirmity, radium should be used.

Most of the cases treated with radium to date have been inoperable. The dosage recommended is 6,000 mgm. hours or more, using two or three mgm. needles having a 1 mm. platinum screen. The needles are placed one cm. apart, into and around the growth, parallel to the bowel lumen. Perforation of the lumen results in serious infection. If the growth is on the anterior wall it is approached through the perineum. The abdomen is opened, and radon seeds placed in the mesorectum and areas on each side. In a favourable case the growth disappears, but in many cases areas of carcinomatous cells are left scattered through the fibrous tissue. Radon seeds or needles may be used, but the treatment of these areas is difficult.

Difficulties in the treatment of rectal carcinoma are: (a) gaining access to the growth, and (b) slow healing due to sepsis (partly due

to necrosis about the needles). Improvement is required in (a) screening of the radium, (b) the use of radon seeds in the abdomen, and (c) methods of asepsis.

S. GORDON

OBSTETRICS AND GYNÆCOLOGY

A Comparison of the Results Obtained in the Induction of Labour by Means of a Bougie or Bag. Morton, D. G., *Am. J. Obst. & Gyn.* **18**: 849, 1929.

Between 1908 and 1928 labour was induced 160 times by means of a bougie, and 49 times by a bag, in the Department of Obstetrics at Johns Hopkins Hospital, for causes other than antepartum bleeding. The bougie used was a large rectal tube, 1.5 to 3 cm. in diameter, inserted without anæsthesia and without rupture of membranes. A Voorhees bag, 8 to 10 c.c. in diameter was the one used, which was also inserted extraovularly when possible.

An analysis of these cases shows that, although the bag may be slightly more effective in stimulating labour, yet the fetal mortality and the maternal morbidity are both twice as great with the bag as with the bougie. Prolapse of the cord, which so often follows premature rupture of the membranes, was the cause of most of the fetal deaths. Rupture of the membranes occurred more frequently when a bag was used. If haste is essential, both the time before the onset of labour and the duration of labour is considerably shorter with a bag. Hence, it is concluded, a bougie is superior to a bag for the induction of labour, unless haste is essential.

ELEANOR PERCIVAL

Diagnosis and Treatment of Disproportion. Fitzgibbon, G., *J. Obst. & Gyn. of the Brit. Empire* **36**: 756, 1929.

With the great increase in antenatal care in recent years, complications of pregnancy have shown a marked decrease. Unfortunately, however, the complications of labour due to dystocia continue, in spite of the fact that Cæsarean section has become a much more common procedure.

Disproportion does not necessarily mean a malformed or diseased pelvis, since 80 per cent of such cases show no sign of rickets or pelvic distortion. The relation of the two factors, namely, the size of the fetus and of the pelvis, must be estimated at term. If the patient is examined at the 36th week, in both a primipara and multipara the head should be engaged in the pelvic brim. If the head is not engaged, this may be due either to a very small child, abnormally lax abdominal walls, or to an excessively large head.

In the latter case, if the degree of disproportion is moderate, labour should be induced between the 37th week and term, when it is thought the fetus has reached the limit of size compatible with the maternal pelvis. The medicinal method of induction should be tried in cases at or near term, whereas at an earlier date the instrumental method is more reliable. The method advocated is by means of a bougie which is coiled inside the uterus in front of the head.

When trial labour has been decided upon and initiated, the patient should be kept in bed and carefully watched. When pains are well established, a rectal or vaginal examination should be made. If the cervix has been taken up and is well applied to the head, and the membranes do not bulge unduly, the prognosis is good. If, however, the cervix, though dilated to admit two fingers, still projects as a definite vaginal cervix, through which protrudes a bulging bag of waters, the prognosis is poor and section should be considered without delay. Asynclitism should be looked upon as evidence of absolute obstruction, and marked moulding, although it may enable delivery to be completed, is always dangerous.

In many of these more difficult cases the termination of labour by the proper application of forceps is a most beneficial obstetric operation.

ELEANOR PERCIVAL

The New Physiology of Menstruation and its Practical Implications in Obstetrics and Gynæcology. Johnstone, R. W., *Am. J. Obst. & Gyn.* **19**: 167, Feb. 1930.

In all female mammals the generative organs have two distinct functions, the sexual or copulative and the reproductive. In the lower mammals the sexual and the reproductive functions occur at regularly recurring intervals. In the human female there is no recognizable œstrus. The reproductive cycle in the human female, just as in the lower mammals, begins with the maturation of the ovum and its release in the act of ovulation and continues with certain changes in the ovary, and with changes in the uterus whether fertilization occurs or not. In the absence of fertilization a regularly recurring pseudo-pregnancy occurs, and its termination is the phenomenon we call menstruation. The stimulus which leads to those changes in the uterus arises in the ovary. The ovary produces two hormones, *alpha* or *œstrin*, which stimulates œstrus in lower mammals, and in women produces uterine congestion; and *beta*, elaborated by lutein tissue, which stimulates preparations in the uterus for nidation and gestation of the fertilized ovum.

Some hormone formed by the trophoblast of

the young ovum probably stimulates the corpus luteum both directly and through the medium of the anterior pituitary. Crew and Wiesner have demonstrated that the two phases of ovarian activity are due to the stimulus of the two anterior pituitary hormones *rho* i, and *rho* ii. Zondek and Ascheim have discovered that the urine of pregnant women contains a hormone from the anterior lobe of the pituitary which causes œstrus in immature female mice. This test for pregnancy has a margin of error of not more than 2 per cent. The pregnancy diagnosis station in the University of Edinburgh, using this test, has been established since January, 1929, and has proved its value.

Tubal pregnancy and chorion-epithelioma give a positive reaction in the majority of cases, while hydatidiform mole gives a strongly positive result. The duration of pregnancy and the cause of the onset of labour may depend on the inter-relationship of the functions of the corpus luteum, the anterior pituitary and the trophoblast. The gradually increasing senile changes in the trophoblast may lead to a cessation of the *rho* ii factor, and thus lead to a shortage in the beta hormone of the corpus luteum.

Abortions may be due to inadequate supply of beta hormone. In primary amenorrhœa œstrin has proved valueless, but in occasional cases of the secondary variety it has been successful, if repeated monthly. Menorrhagia may be due to excess of œstrin dependent upon excess of the *rho* i factor from the anterior pituitary. Dysmenorrhœa may result from failure of the beta hormone, while sterility may be due to inadequate preparatory changes in the uterus from too little *rho* ii, and consequently too little beta hormone. Menstruation in such cases is the abortion of a fertilized ovum.

ROSS MITCHELL

PÆDIATRICS

The Comparative value of Irradiated Ergosterol and Cod Liver Oil as a Prophylactic Antirachitic Agent When Given in Equivalent Dosage according to Rat Units of Vitamin D. Barnes, D. J., Brady, M. J., and James, E. M., *Am. J. Dis. Child.* **39**: 45, Jan. 1930.

Two hundred and sixteen unselected infants, appearing at the Child Welfare clinics of Detroit, were placed in four groups for the purpose of this experiment. Group 1 was given daily 1,250 rat units of vitamin D in the form of irradiated ergosterol. Group 2 was given daily 1,400 rat units of vitamin D in the form of cod liver oil. Group 3 received 3,750 rat units of vitamin D daily in the form of cod liver oil and irradiated ergosterol, mixed in such a manner that the ergosterol contributed three-fifths of the potency of the mixture. Group 4 served as controls. The duration of the experiment was 100 days. Blood calcium and phosphorus determinations formed the chief criterion by which the efficacy of the antirachitic agents was appraised. Rickets was prevented or cured in 98 per cent of those receiving cod liver oil and in a similar proportion of those receiving a mixture of cod liver oil and irradiated ergosterol. Cod liver oil alone was quite as effective as cod liver oil plus ergosterol. Irradiated ergosterol as the sole antirachitic agent was effective in 44 per cent of cases, and the results in this group were not superior to those in the control group. The incidence of rickets did not differ in the breast-fed and in the artificially fed infants. The authors conclude that rat units of vitamin D in irradiated ergosterol cannot be considered as equivalent to the same number of rat units of vitamin D in cod liver oil as a curative or prophylactic remedy for human rickets.

A. K. GEDDES

Antimeasles Diplococcus Serum (Tunnicliff). Peterman, M. G., *Am. J. Dis. Child.* **39**: 294, Feb. 1930.

Peterman reports that of sixty-one children and six nurses with no previous history of measles, 74.6 per cent were protected against the disease when given Tunnicliff's antimeasles diplococcus serum within five days after exposure.

A. K. GEDDES

Obstruction of the Œsophagus in Childhood. Sheldon, W., and Ogilvie, A. G., *Arch. Dis. Child.* **4**: 347, Dec. 1929.

Ten cases of congenital narrowing of the œsophagus at the level of the seventh thoracic vertebra, midway between the level of the diaphragm and the bifurcation of the trachea, are reported by Sheldon and Ogilvie. The patients ranged in age from nineteen months to eight years. All were stunted and greatly underweight. Vomiting, often periodic, usually dating from birth, and aggravated when solids were introduced into the diet, was the chief symptom. Roentgen examination showed opaque meals to be retained in the œsophagus. Two cases came to autopsy; one showed a fibrous constriction of the œsophagus; the other, dying of tuberculosis after œsophageal symptoms had disappeared, showed a normal œsophagus. Two cases of congenital stenosis of the œsophagus at the level of the diaphragm are also recorded, with autopsy findings. The etiology of the condition is discussed. Treatment is by a persistent fluid diet; the passage of bougies is considered harmful. The question of achalasia and spasm of the cardia in infancy and childhood is reviewed, and one case reported. A. K. GEDDES

The Kahn Precipitation Test in Infancy and Early Childhood: A Comparative Clinical Study with the Noguchi-Wassermann Reaction. Caffey, J. P., and Kreidel, K. V., *Am. J. Dis. Child.* **38**: 1206, Dec. 1929.

Since the introduction of the Kahn test in 1922 numerous reports have demonstrated its value in the serodiagnosis of syphilis. Few data have been available, however, on experience with the Kahn test in juvenile syphilis. This report of Caffey and Kreidel, covering a period of 33 months at the Babies' Hospital, New York, and based on 1729 cases in which the results of parallel Wassermann and Kahn tests were analyzed and correlated with the clinical findings, constitutes the first extensive critical study of the Kahn reaction in congenital syphilis.

Following the technique of Kahn, total precipitation readings of six or more were considered positive. The complement fixation reaction employed was the standard Noguchi modification of the Wassermann, and only three plus and four plus readings were considered positive. Serological examination was made of 1185 infants and young children in whom there was some special indication for investigation for syphilis, of 43 children under treatment for syphilis, and of 317 mothers.

In the 1185 patients, clinical investigation indicated a diagnosis of syphilis in 104 cases. The Noguchi-Wassermann and the Kahn tests were in agreement in 90 cases and in disagreement in 14 cases. Of the 14 discrepancies, six were favourable to the Wassermann test and eight were favourable to the Kahn test. Five serums in which the Wassermann reaction was anticomplementary gave positive Kahn tests. Both tests were negative in one infant of nine weeks with frank syphilis; three weeks later, after treatment, both tests were positive. The sensitivity of the Wassermann is computed as 91 per cent and that of the Kahn test as 93 per cent.

Analysis of the 1081 cases considered non-syphilitic shows that false weakly positive reactions occurred with both tests. In no case were the Wassermann and Kahn tests simultaneously positive in a non-syphilitic. From the data on these 1081 cases the specificity of the Wassermann is rated as 98.8 per cent and that of the Kahn test as 98.1 per cent. In patients receiving antisyphilitic treatment the Kahn test showed a much higher sensitivity than the Wassermann. Positive Wassermann reactions were more easily reversed by therapy than were positive Kahn reactions. In the serological examination of 71 mothers of syphilitic infants, the Kahn test was found to be 25 per cent more sensitive than the Wassermann. The serum of syphilitic mothers early post-partum often gave a positive Kahn in the presence of a negative Wassermann.

The authors conclude that the Kahn test performed alone would have given slightly more reliable information than the Noguchi-Wassermann performed alone on this group of patients; the combination of the two tests gives more information than either test alone, and is therefore recommended. A. K. GEDDES

PATHOLOGY AND EXPERIMENTAL MEDICINE

The Ætiology of Diverticulitis. Lockhart-Mummery, J. P., *The Lancet* **1**: Feb. 1, 1930.

The author presents an interesting article regarding the etiology of diverticulitis of the colon. He believes that all cases of diverticulitis which cause symptoms are acquired and not of a congenital origin. To support this he cites the fact that multiple diverticula occur only after middle life and that cases watched with x-rays over a long period of time show progression. X-ray evidence of very early diverticulitis would lead one to believe that their origin was inflammatory. The author, however, believes that the development of minute multiple diverticula is the primary stage and is unaccompanied by any inflammatory condition. The earliest stages are small millet seed projections on the outside of the colon, arranged in rows mostly along the longitudinal bands, which tend to occur at the points where the lymphatics and blood vessels perforate the muscular coat. Usually, no inflammation accompanies these millet seed diverticula. Apart from this pouching of the mucous membrane the bowel wall is normal. It seems most probable that the diverticula start as a true pulsion hernia, and that after their formation a retained fæcal content is likely to set up inflammation. This secondary inflammation may never occur. The cause of the beginning of the diverticula is probably a degeneration of the bowel wall from age and unnatural conditions of the bowel function. In favour of this is the fact that the condition is confined to the second half of life, and is most frequently seen in fat people. Inflammation over a large area of involved bowel will produce the typical fibrous stricture that we see in cases of this type. Evidently two types of diverticulitis are commonly seen. In the first type inflammation is widely spread and produces the dense and progressive thickening and fibrosis of the colon. Ultimately a firm fibrous stricture develops, which clinically resembles a carcinoma of the colon. The second type is the commoner in which the diverticula grow to a considerable size without any accompanying inflammation. They cause no symptoms and the disorder is only potentially serious. From this type abscess and perforation develop.

W. L. GRAHAM

Lactic Acid and Carcinoma of the Stomach. Dodds, E. C., and Robertson, J. D., *The Lancet* **1**: 171, Jan. 25, 1930.

Having shown in a previous paper that in non-malignant cases the resting stomach contents show lactic acid in 46 per cent and the fractional meal samples in 36 per cent, further studies were made to determine the source and type of this acid and its relation to the diagnosis of malignancy. The methods used are described and the acid studied, in the form of its zinc salt, as to its rotary power. Seven cases are cited, five malignant and two non-malignant. In all of these the acid was found to be of the inactive type (associated with fermentation), not the lævorotatory type (sarcolactic acid, associated with cell metabolism). The cases having pyloric obstruction gave the highest values for lactic acid, regardless of whether they were malignant or benign. It is also shown that the high values found by some observers and the rapid appearance of lactic acid attributed to new growth is in reality the result of inadequate washing of the stomach prior to the test, the acid later making its appearance from pockets and crevices in the neoplasm where fermentation had occurred. The method of washing is described.

It is concluded that the presence of lactic acid in the stomach is an index of fermentation, usually the result of pyloric obstruction, and has no value in differential diagnosis of malignancy.

J. B. ROSS

NEUROLOGY AND PSYCHIATRY

The Non-specific Treatment of Neuro-syphilis. O'Leary, P. A., and Brunsting, L. A., *J. Am. M. Ass.* **94**: 452, Feb. 15, 1930.

In this "Fifth Annual Report" the authors review the experience of the section of dermatology and syphilology of the Mayo Clinic in the fever treatment of neurosyphilis. The paper deals with the present status of patients who have had this treatment and who have been under observation for from three to five years.

In 100 patients inoculated with plasmodium vivax during the period June, 1924, to June, 1926, early signs of paresis had been evident before the treatment was instituted. The majority had previously had other treatment for neuro-syphilis. Of this number, 38 are in full remission, 31 are improved, 17 have not been benefited, 14 are dead. Only those capable of supporting themselves and their families are classed as "in remission". Five of the deaths resulted from the malaria, 3 from paresis, the remaining 6 from other causes. In most cases of remission the serological reactions of blood and spinal fluid are negative.

In tabo-paresis the results have been less satisfactory. Of 13 patients, 4 are in remission, 3 are somewhat improved, 6 are dead. These patients had been under treatment for tabes dorsalis for years but had grown progressively worse, and treatment by malaria was tried as a last resort. The authors regard cases of this type as unsatisfactory for fever therapy, as the progressive downhill course is frequently accelerated by the treatment.

A group classified as paresis *sine paresi*, or asymptomatic paresis, including a number who had failed to respond to intravenous, intramuscular and intraspinal measures, gave satisfactory response to fever therapy. In these cases there had been evidence of clinical progression and failing acuity, but not sufficient mental impairment to warrant a diagnosis of paresis. In this group of 22, 10 showed negative serological reactions and decided clinical improvement, 6 have improved, 4 have not benefited, 2 have died. Patients of the type included in this group are regarded by the authors as ideal cases for fever therapy.

Encouraging results are reported in the malarial treatment of neurosyphilis associated with acute syphilis of the meningeal type, but in tabes dorsalis the results have not been very satisfactory. In general the authors recommend fever therapy when prolonged treatment with the arsphenamines and mercury, commenced early, has failed to control unfavourable progress, as indicated by the condition of the spinal fluid. The serological reaction, however, is not always an index of the value of treatment. Clinical improvement is not necessarily paralleled by serological improvement, while negative serological reactions are sometimes obtained without clinical improvement.

The authors have used typhoid vaccine, intravenously, to reactivate the chills and fever of patients in whom the malaria aborted after a short and incomplete course. They have also used it in cases in which malaria could not be induced. As yet they feel indisposed to pronounce judgment on its merits, but state that satisfactory results require a larger series of chills than with malaria, and that increasingly large doses of the vaccine are needed to produce satisfactory reactions. In their experience thus far, remissions have been less frequent and less pronounced under the vaccine treatment than under malaria.

W. H. HATTIE

OPHTHALMOLOGY

Eye Symptoms and the Parkinsonian Syndrome. Goldbach, L. J., *Arch. Ophthal.* **2**: 555, Nov. 1929.

The etiology and symptomatology must be clearly defined and confirmed by microscopic study before the relation of the Parkinsonian syndrome to ocular symptoms can be properly

classified. Encephalitis is extremely varied in its portrayal of symptoms; in certain phases it has a predilection for the ocular muscles and again it apparently ignores the ocular syndrome. Much has been written about encephalitis, but after a perusal of the literature one finds that there is a good deal of conjecture with nothing definite to substantiate it. To visualize encephalitis brought about by a blood-borne infection, and years afterwards to find ocular palsies, compels one to be rather reserved in making conclusions as to the direct factors associated with these manifestations.

The ocular symptomatology of the post-encephalitic cases is far from clear. The difficult and at times transient muscle imbalance—the changes from a normal to an excessive variation—certainly result in untenable diagnoses. When a definite paresis is present, the etiology is more certain; but, when there is a partial or spastic condition of the ocular muscles, either internal or external, the problem becomes more complicated, and the results more unsatisfactory. The retarded action of the superior recti, and the impossibility of holding the muscles for any length of time without tiring, especially when the patient is observing intently, is rather characteristic; anisocoria may be associated with these symptoms.

Nonne, considering ocular changes in relation to encephalitis in contrast to other ocular symptomatology, made the following classification: (1) Encephalitis in which bulbar symptoms are present; (2)premature paralysis agitans, but without an inclination to sleep; (3) bulbar paralysis without ocular changes.

According to recent anatomico-physiological researches, at least four more paths to the region between the commissural mesencephalic nuclei and the globus pallidus are recognized, all connected with forced movements of the eyeball. Unless one is especially interested, it is easy to pass by insignificant symptoms and place no importance upon them. Temporary diplopia, anisocoria, disturbance of accommodation, oscillation of the eyeball, and intermittent and alternating strabismus, when no other cause may be found on careful study, would suggest a former infection. In some cases there remain permanent disturbances of the cerebral nerves, and among the most important are the reflexes and absolute paresis of the pupil. The Argyll-Robertson pupil can no longer be considered as pathognomonic of syphilis.

S. HANFORD MCKEE

The Eye in Diabetes Mellitus. Cohen, M., *Arch. Ophthal.* **2**: Nov. 1929.

The ocular lesions complicating diabetes are varied and occur in from 20 to 30 per cent of the cases. Retinitis is the most frequent lesion. The other diseases of the eye which more rarely accompany diabetes are cataract, chronic retrobulbar neuritis, muscular disorders, disturbances of accommodation, refraction and iritis. Such lesions as thrombosis of the retinal veins, with or without hæmorrhages, proliferating retinitis, and secondary glaucoma, which are recorded as the result of diabetes, as a matter of fact rarely occur during its course. They are of vascular origin and exist coincidentally with the diabetes. In young adults suffering from grave diabetes with lipæmia and coma, the condition is known as lipæmia retinalis. This is the only lesion of the fundus which may be considered as pathognomonic of diabetes. Children rarely show any complication of the eye in this disease. The structure of the eye most frequently involved in diabetes is the retina, primarily its vessels, the most typical example being lipæmia retinalis, which involves both eyes and occurs in severe diabetes. About thirty-one cases are reported in the literature. It is Cohen's opinion that the appearance of lipæmia retinalis is closely related to the total fat content of the blood rather than to the cholesterol which occurs in nephrosis in which lipæmia retinalis is not seen; the latter condition is probably due to the pathological amount and quality of the blood fat in each case.

Diabetic retinitis is usually bilateral. The characteristic appearance consists of normal looking discs with glistening whitish plaques, sharply outlined and arranged in a circular manner around the macula. These are probably due to a fatty degeneration. There are a few small discrete circular hæmorrhages located around the macular area too. These hæmorrhages are probably due to a diapedesis of the red blood cells from the deep terminal capillaries. The retinal vessels frequently show definite pathological evidence of varying degrees of arteriosclerosis. A general hypertension, if present, is apt to aggravate the lesion of the fundus. When diabetic retinitis is complicated by nephritis or arteriosclerosis, the retinal picture is not especially significant of either of those diseases unless that complication is predominant.

Diabetic retinitis is due mainly to disease of the retinal vessels, and in some instances diabetes influences the fundus picture in an early stage. Cohen considers diabetic retinitis either as a retinal arteriosclerosis in diabetes or, if the vascular lesion is severe, as an arteriosclerotic retinitis in diabetes.

S. HANFORD MCKEE

RADIOLOGY

Primary Hemangioma of Bone, with Special Reference to Roentgenologic Diagnosis. Bucy, P. C., and Capp, C. S., *Am. J. Roentg. & Radium Ther.* **23**: 1. Jan. 1930.

This contribution is a work of definite value, the authors believing that from the roentgenogram, in a majority of cases, a diagnosis can be made. Eight cases from various sources are presented. Descriptions of clinical signs, pathology, differential diagnosis and treatment are given in detail. The conclusions of the authors are as follows: Hemangioma of the vertebræ producing symptoms is rare. Symptoms when present are those of compression of the spinal cord. The roentgenological appearance is typical and easy to recognize. Hemangioma of other parts of the skeleton presents no characteristic clinical signs. The bones of the skull are most frequently involved. The roentgenological appearance is of two types: (a) In flat bones "sun-burst" trabeculations of unusual size radiate usually from a common centre, and mostly from the plane of the bone. The periosteum may be considerably elevated, but is apparently not broken through. (b) In cylindrical bones, the tumour is loculated. These loculations are small, with interspersed, fine, fibrillary framework. The cortex is usually destroyed but may extend into the centre of the expansile tumour. The periosteum though expanded remains intact.

The microscopic appearance is that of a benign hemangioma, usually cavernous, though one capillary hemangioma is reported here. Amputation is never indicated. Excision of the tumour, when possible, gives the earliest and best results. Roentgenological therapy over a considerable period of time is equally effective and satisfactory. Radium is as yet untried but may prove useful.

A. STANLEY KIRKLAND

The Intravenous Method of Cholecystography and Liver Function Test as Employed in Office Practice. Waters, C. A., and King, J. H., *Am. J. Roentgen. & Radium Ther.* **14**: 34, Jan. 1930.

The introduction summarizes the various steps which led up to the roentgenological visualization of the gall bladder. The various salts which produce cholecystograms are described and phenoltetraiodophthalein or isoiodeikon (Mallinckrodt) is chosen by the author because it stains the blood serum and thereby allows a colorimetric determination of liver function. The technique of this estimation is given as well as the author's technique of administration, using the intravenous method. This description is instructive and the conclusions are most reasonable. A discussion of the paper by Dr. James T. Case and others is worthy of careful reading in the full text by those doing this special work.

A. STANLEY KIRKLAND

Education and Instruction in Roentgenology. Meyer, Wm. H., *Radiology* **14**: 24, Jan. 1930.

Stress is laid on the need for better instruction of undergraduates in the principles of roentgenology, especially as to the interpretation of x-rays with relation to physiology and disease. The writer points out that owing to the present paucity of lectures to students it happens that post-graduate education is frequently elementary. The lack of general information about the possibilities and limits of this relatively new specialty leads to many unpleasant experiences both for the roentgenologist and for his associates. The lay public and sometimes institutional boards find it difficult to appreciate the advisability of retaining and filing all x-ray negatives. It is pointed out that it is advantageous to centralize x-ray installations of x-ray apparatus in institutions, to increase teaching facilities, to improve technical results and to save expense. This is a very pertinent suggestion, as many specialists have a desire to install x-ray apparatus in special clinics far from the central x-ray laboratory, with resulting mediocre results and added cost of maintenance.

A. STANLEY KIRKLAND

HYGIENE AND PUBLIC HEALTH

Cyanide Poisoning, Acute and Nonfatal, apparently from Hotel Silver Polish. Williams, H., *J. Am. M. Ass.* **94**: 627, March 1, 1930.

The state of medical knowledge regarding food poisoning is rather uncertain. It is generally conceded that there is no such thing as ptomaine poisoning, but the exact nature of many cases of obvious food poisoning is often obscure. Certainly, the theory of infection by the parathyroid group is not always a satisfactory explanation. Williams describes a number of cases of food poisoning, and attributes on very good evidence their causation to sodium cyanide contained in silver polish. It is apparently a practice in many hotels to clean silver with polish which contains rather large amounts of sodium cyanide. This material is a very efficient brightener of silver surfaces, for the mere dipping of silverware into a cyanide solution is sufficient to remove tarnish. Williams, himself, together with his family was apparently poisoned by this material, his symptoms taking the form of a severe gastroenteritis. Other cases from New York State are reported. In all the outbreaks investigated cyanide was used in the silver polish. Many

of the hotel managers stated that numerous complaints had been received by them of obscure food poisoning, and these complaints ceased when the silver polish was changed. The city of Newark has placed a ban on the use of this material, and so has the State of New York.

FRANK G. PEDLEY

Unemployment in Buffalo. *Special Bulletin No. 163, N. Y. State Dep. of Labour*, Albany, 1930.

The matter of unemployment is of interest to all groups in the community. To the merchant and manufacturer it means decreased buying power, to the professional man it means an increased demand on his charity, to the public health worker it forecasts increased sickness.

Various estimates have been made of the number of unemployed in the United States. The estimates vary from one to five million, and are at best only more or less intelligent guesses. The Buffalo survey has endeavoured to obtain reasonably accurate data of unemployment. The plan was to enumerate samples of the population from nine districts scattered throughout the city. In all 15,164 persons of both sexes were interviewed. None of these persons were attending school, and all were over 18 years of age.

Some of the interesting facts elicited by the survey are as follows: Of the 12,331 males enumerated 10.9 per cent were unemployed, and half for more than ten weeks. Of the group of more than 1,000 unemployed individuals one-half were unemployed on account of slack work, and one-quarter on account of sickness. With this unemployed group should be associated another group of nearly 800 who were working only part time.

To the medical man the information relating to sickness is perhaps the most interesting. No effort was made to determine the cause of sickness, but the duration was tabulated. Of the whole group of 15,164 persons, 311 (2.1 per cent) were unemployed on account of sickness or injury. One hundred and ninety-eight of these individuals had been sick for more than ten weeks, and 134 for more than a year.

As is pointed out "An examination of the results of this study cannot but impress one with the seriousness of the problem of unemployment and under-employment. The figures in this study relate definitely to certain areas in Buffalo, but there is no reason to believe that conditions are greatly dissimilar in industrial areas in other cities of the same general type."

FRANK G. PEDLEY

ANÆSTHESIA

Vascular Depression of Spinal Anæsthesia. Sise, L. F., *Surg. Clin. N. Am.* **2**: 1369, 1929-30.

Deaths during spinal anæsthesia are due mainly to vascular depression. The vasomotor fibres proceeding from the spinal cord are paralysed and blood collects in the dilated arterioles. A secondary cause of low blood pressure is respiratory depression. This is always present to some extent. If the anæsthesia extends to the upper dorsal cord the heart is slowed because the accelerator fibres are paralysed, the vagus control being then unopposed. Psychic influence also plays a part in lowering blood pressure.

If the head is lowered by putting the patient in the Trendelenberg position the blood gravitates towards the vital nerve centres and hydrostatic action tends to maintain a higher pressure in them than is present in other parts of the body. If the patient, however, has large masses of abdominal fat, the movements of the diaphragm may be impeded and respiration hampered. Interference with breathing may also be caused in fat patients by the use of abdominal packs and retractors. If the blood pressure does not fall more than a third the results of subcutaneous medication will be prompt and satisfactory. If it drops more than this, absorption from the tissues is slow and unsatisfactory.

The best drug to use to combat circulatory depression is ephedrine. It may be necessary in extreme collapse to inject it directly into the heart. Given before the anæsthesia it exerts a powerful influence in keeping up the blood pressure. The effect of an ordinary dose lasts one to two hours. The size of the dose should be varied to correspond with the height of anæsthesia and its probable duration.

W. B. HOWELL

La Narcosi coll "Avertina." (Anæsthesia with Avertin). Klimko, D., *Il Policlinico, sez. Chirurgica* **36**: 474, Sept. 15, 1929.

Avertin is tribromethyl alcohol. It decomposes when exposed to light, if dissolved in alcohol, or if heated to 35° or 40° C. in aqueous solution. The product of decomposition is dibromacetic aldehyde, a compound very irritating to mucous membranes.

The writer observed 100 patients anæsthetized by the rectal injection of avertin at Prof. Bakay's clinic at Budapest. The evening before operation the patients were given one gram of veronal per rectum, and one hour before operation 1 c.c. of pantopon hypodermically. The first dose was 0.10 gram per kilogram of body weight. Smaller supple-

mentary doses were given later if necessary. The solution was freshly prepared for each patient and tested to demonstrate its freedom from dibromacetic aldehyde.

In 16 of the cases observed it was found necessary, on account of respiratory depression, to administer CO_2 and lobeline hypodermically. In 50 there was a fall of blood pressure of from 20 to 50 mm. of Hg. In 8 the fall amounted to 60 or 70 mm. These eight were given caffeine and camphor. Seventy-seven of the patients required some ether in addition to the avertin. Three had mild, and two moderately serious, attacks of pneumonia after operation. One patient had fever, tenesmus, and blood in the stools the day after operation.

The writer quotes Killian as having collected particulars of 3,476 operations under avertin anæsthesia. Among them were 16 deaths attributable to the drug itself. In 4 of these fatal cases there was necrosis of the bowel. Other surgeons have reported thousands of cases without any deaths.

W. B. HOWELL

Spinal Anæsthesia in Major Surgery. Jackson, A. S., *Ann. Surg.* **91**: 256, Feb. 1930.

The author believes that the institution of spinal anæsthesia is one of the most outstanding contributions to the development of surgery. Its introduction in routine surgery is due to the re-discovery of ephedrine.

Novocain crystals, 100 to 200 mgm. ampules, and ephedrine (gr. ¾) are used. Preliminary medication (sodium barbital, gr. 10 and pantopon, gr. 1/3) is used. The ephedrine is given five minutes prior to the novocain. In large individuals more spinal fluid is withdrawn than in small. A 22 gauge spinal needle is used, and no headache has followed its use. Blood pressure and pulse are watched by a competent anæsthetist.

For the past year the author has used spinal anæsthesia as a routine in all major operations below the diaphragm, and in some minor ones, *e.g.*, cystoscopy. He reports 1,000 cases in which there were no deaths attributable to the anæsthetic, which was successful in practically 100 per cent of cases. It was used in gastro-intestinal perforation and in localized peritonitis successfully.

The author states that inhalation anæsthesia should not be used except in certain minor operations, or major operations about the head. Five per cent of patients questioned preferred to be asleep. This percentage can probably be eliminated by the use of some of the newer sedatives.

S. GORDON

Obituaries

Frederick LeMaitre Grasett, M.B., C.M., M.R.C.S., L.R.C.P., F.R.C.S. (Edin.), died at his home in Toronto, on February 16, 1930, after being laid up for some two months. He had been seriously incapacitated for some time by a popliteal aneurism, although he continued to attend meetings of organizations in which he was interested and to enjoy seeing his friends during this time. For a man who had always led such an energetic life, the inability to indulge in his usual activities must have been a trying ordeal, but he retained his bright and cheery disposition throughout this irksome period. No doubt, he was helped in assuming this optimistic attitude towards life by the sincerity of his religious faith, which was deeply ingrained into his character. Heredity and environment in his early life, as the son of the late Dean Grasett of St. James Cathedral, bore their fruits richly and profoundly influenced his daily actions during his life.

In 1883, he married Jane Stuart, daughter of the late A. Thornton Todd, with whom he enjoyed forty-seven years of happy married life, and to whom the heartfelt sympathy of his friends and colleagues is most sincerely offered. He is also survived by one married son, living near Fergus, Ontario.

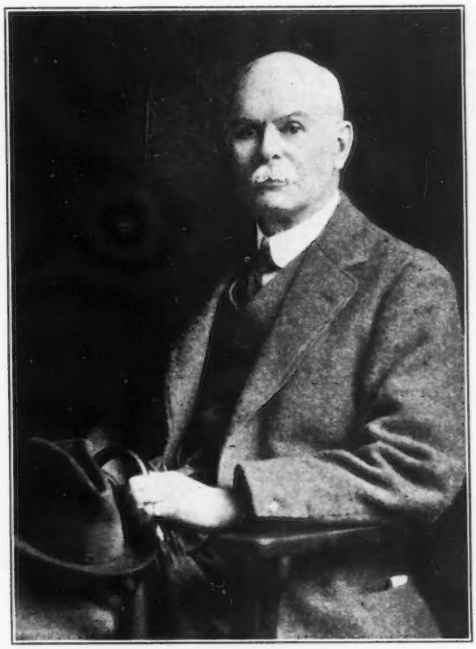
Dr. Grasett was born in 1851 in Toronto and received his early education in a private school and in Hellmuth College, London, Ontario. He was sent to Scotland for his medical education, where he graduated in 1873 in the University of Edinburgh with the degrees of M.B., C.M. As an undergraduate, his instruction in surgery was given by Joseph Lister (afterwards Lord Lister), who had succeeded James Syme in the Chair in Surgery at the University of Edinburgh in 1869, after occupying a similar position at the University of Glasgow for ten years. In 1874, he was particularly honoured by receiving the appointment as house-surgeon to Lister, the first occasion on which a Canadian had obtained such a position. His interest in surgery and his admiration of the great surgeon were such that he stayed with him for four years, and the grounding and training he received at this time formed the foundation of his success in the future as one of the great Canadian surgeons. In addition to the practical experience he was gaining in these years, Dr. Grasett continued his studies and obtained his M.R.C.S. and L.R.C.P. in 1875, and his Fellowship of the Royal College of Surgeons of Edinburgh in 1877. He was also appointed Fellow of the Obstetrical Society of Edinburgh. At the Lister Centenary in Toronto, in 1927, in speaking of his association with Lister, he said "He was the greatest surgeon and pathologist that ever lived. He was a wonderfully genial young fellow and just as fine a man as could be."

On his return to Canada, Dr. Grasett immediately received a teaching appointment in a medical school and from that time until 1910, a period of thirty-four years, he continued to hold academic positions and was engaged in teaching medical students. His first appointment in 1876 was in the last year of its existence as such of the Medical Department of the University of Trinity College, when he was an Instructor on Surgical Appliances. In the same year, he became Physician to the Burnside Lying-in Hospital and the Toronto Dispensary on King Street. In 1877, Trinity Medical School was

incorporated as a separate and independent unit with affiliation with Trinity University, University of Toronto, and Halifax University. Dr. Grasett became Lecturer on Medical Jurisprudence and Assistant Lecturer on Surgery in this school, with which institution he remained until its federation with the University of Toronto in 1903. At the same time (1877) he became a member of the acting staff of the Toronto General Hospital. From 1881 to 1886 he was Professor of Medical Jurisprudence, and in 1887 was appointed Professor of the Principles and Practice of Surgery and Clinical Surgery in Trinity Medical School, and in 1903, after federation, he became Professor of Surgery and Clinical Surgery in the University of Toronto. On his retirement in 1910, he became Professor Emeritus in this University.

Many of the professors, with whose names that of Dr. Grasett will always be associated, are recalled to mind when thinking of this famous teacher. Some of the more outstanding of these were Hodder, Bethune, Bovell, Geikie, Fulton, Covernton, Temple, Ellis, Sheard and Teskey and in the later period, Bingham, Shuttleworth, Powell, Wishart, Allen Baines and Davison. Trinity Medical School of that period had a teaching staff second to none, and many of its graduates look back with pride and gratitude upon the men who taught them to become practitioners of medicine.

As Professor of Surgery at Trinity Medical College, Dr. Grasett will be remembered as a forceful and inspiring lecturer. He systematically covered a subject and would intersperse it with examples of cases from his own experience, as he walked up and down the platform or half sat on the edge of the table. I can still recall his vivid word picture of the operation for left lateral perineal lithotomy—how he would say as he sat in front of his patient in the lithotomy position "Here I have my scrotum; here I have my perineum. I thrust my knife boldly through the perineum into the bladder. I quickly follow it with my finger and out comes the stone as quick as wink." And many of those who have seen him perform this operation will testify that he carried it out about as rapidly as he said it and with a deftness and precision that were remarkable.



Dr. Frederick LeMaitre Grasett

His ability as a surgeon was of the highest quality. In consequence of his training under Lister, he was a pioneer in Canada in the use of antiseptic methods in surgical technique. He brought home with him one of Lister's carbolic sprays and used it on many occasions, until more improved methods resulted in its being laid on the shelf. He later presented his spray to the Academy of Medicine, Toronto. He was quick and deft with his hands and successfully performed most of the major surgical operations of that time in a masterly fashion.

Although Dr. Grasett was a leading surgeon of his day, he was a general practitioner of the old school and had a large practice in Toronto, numbering among his patients many of the prominent citizens of the old families with a historical background. He was an excellent obstetrician, doubtless from his contact with the great Sir James Y. Simpson at Edinburgh, and for many years was Physician to the Burnside Lying-in Hospital.

As was the case of the practitioners of those days, he was the counsellor and friend of the family, helping the worried and anxious by his advice and comforting them by his cheery presence. He travelled his rounds from house to house in a smart turnout with a well groomed and spirited horse, the harness and brass fittings immaculately clean and shiny. His fondness for horses and riding were among the hobbies that he indulged in up to his last few years. In this later period, he took up golf as well as riding and was an enthusiastic follower of the game.

For many years he was Surgeon and later Honorary Surgeon to the Governor General's Body Guard, in whose blue and white uniform and glistening helmet, he made a striking and soldierly figure. Throughout his life he was an ardent churchman, belonging to the congregation of St. James Cathedral and acting as Rector's Warden for many years. He took an active part in many of the charitable institutions and organizations of the city, upon many of the boards of which he sat and gave of his best. Only within the last year was he appointed Chairman of the Board of Industry. He was a member of the Canadian Council of the Red Cross Society and of the executive committee of the Victorian Order of Nurses.

By his own profession he was honoured in 1895 by being elected as President of the Canadian Medical Association.

When he retired from practice, hospital and university work, he became one of the chief Medical Referees of the Canada Life Assurance Company with Dr. H. Crawford Scadding, and his decisions soon gained the respect and admiration of the Directors of this large enterprise. He took an active part in several large industrial organizations, sitting on the Board of the Consumer's Gas Company of Toronto for many years, and assisting this body in the appraising of disabilities and sicknesses among its employees.

In the death of the late Dr. Grasett, there passed away one who had formed many associations in the variety of activities with which his life was full to overflowing. He will be remembered as a brilliant student, an excellent teacher, a skilful surgeon, a beloved physician, a devout Christian, and a loyal friend and colleague.

Any tribute which the writer could pay him who had brought him into this world, who had been the physician and closest friend of his father and mother, who had been the inspiration to follow in his footsteps in the profession, and who had remained a true friend and counsellor throughout his life, could not be expressed in words, but this very inadequate token of respect to his memory is paid with the deepest reverence and admiration.

E. STANLEY RYERSON

As a former pupil and later colleague of Dr. Grasett, I should very much prize the privilege of a little space for a few words in his memory. To the younger members of the profession and those who had not enjoyed the advantage of personal contact with him as a teacher his reputation has come down by way of tradition. But to those who recall the place he held, both as teacher and practitioner, prior to the amalgamation of Trinity University with the University of Toronto in 1903, his memory will remain in their enthusiastic regard to the end of their days. He represented, as but few of his time did, the characteristics of pre-Listerian days, the speed and dexterity of his own teachers in Edinburgh, whose early training had preceded the general use of anæsthetics, and the punctilious attention to antiseptis which Lister himself had taught him.

No one who witnessed it could forget a scene which I recall in the old days in the operating theatre of the old Toronto General Hospital. The theatre was filled to the top with students, and the first patient who came in the list for the afternoon was a bluff, taciturn Englishman of the navvy type, whose second toe, I forget on which foot, was to be removed. When Lr. Grasett came in, brisk and cheery and debonair as he always was, the patient declined an anæsthetic on the ground that he did not need it. After a little argument the surgeon concurred. The man sat up on the table with the foot over the end of it and grasped the two sides of the table, while with three dexterous easy strokes of the scalpel the toe was removed in about two seconds, as accurately as if ten minutes had been spent on it. The crackling burst of applause, like summer thunder, which broke spontaneously from every student in the room was meant quite as much for the surgeon's skill as for the patient's pluck and good conduct.

In his relation to his fellow practitioners he was always an exemplar of kindliness, uprightness, and bonhomie, and of the spirit of doing as you would be done by. His systematic lectures on surgery were always models of careful thinking, accurately set forth, without padding or verbosity, in clear and scholarly English, the result of sound training, both pre-medical and professional.

Many hundreds passed through his hands as students, and scores of them scattered throughout Canada and the United States and in the wider spaces of the Empire, survive to hear of his demise with more than mere passing regret and with a deep sense of their indebtedness to him. J. T. FOTHERINGHAM

Robert Fulford Ruttan, B.A., M.D., D.Sc., F.R.S. (Can.), for more than forty years a teacher in the Department of Chemistry in McGill University, passed away peacefully at his residence in Montreal on the evening of February 17, 1930. Born at Newburgh, Ontario, in 1856, the son of Dr. Allan Ruttan, a well-known and highly respected physician of Addington County, he received his early education in Napanee Collegiate Institute, and after passing with credit through its forms entered the Arts Faculty of the University of Toronto. From there he graduated in honours in 1881, capturing the gold medal in the Department of Natural Science.

The Faculty of Medicine in McGill University at that time ranked high among the medical schools of Canada. His father had graduated from it in 1852, and several of his father's fellow students had become teachers in the university. The names also of William Osler, George Ross, and Frank Shepherd had already become recognized as those of outstanding teachers. Thus young Ruttan was directed to McGill for his medical studies. Here he obtained the Sutherland Gold Medal in 1883, and graduated the following year with honours. Chemistry was now making notable advances in the scientific world, and Germany was its most active centre. So to Germany he went and spent the following two years under Hoffmann in Berlin. Dr. G. P. Girdwood was then Professor of Chemistry in McGill and had already noticed the talents of Ruttan, so on returning in 1886 he was at once appointed as his assistant with the title of Lecturer. Two years later he became Assistant Professor of Chemistry, in 1891 Registrar of the Medical Faculty, and in 1894 Professor of Practical Chemistry. He continued his office of Registrar until 1901. In 1902 he was appointed to the Chair of Chemistry, and in 1908 to the Chair of Organic and Biological Chemistry. In 1912 the university department of chemistry was re-organized and Professor Ruttan, who up until that time had been in charge of that subject in the Medical Faculty only, was now made Director of the University Department. In 1924 he was appointed Dean of the Faculty of Graduate Studies and Research.

When the National Council for Research was organized by the Dominion Government, he was made a member of that body as well as of the Biological Board of Canada. In 1919 he was elected President of the Royal Society of Canada, and the following year President of the Society of Chemical Industry of England. He was the only overseas man on whom this honour was conferred. He was also a Fellow of the Institute of Chemical Engineers of London and of the Biological Society of America.

Dr. Ruttan was an earnest teacher and won the respect and affection of his students, and the esteem of all his colleagues to an unusual degree. He was a sincere and generous friend, fond of his work, and in his career enthusiastically carried through much original research himself. In later years, as Dean of the Faculty of Graduate Studies, he gave opportunity and unstinted assistance to younger men to carry on research in the special lines in which they might be interested.

Dr. Ruttan was fond of sport. As a student he was recognized as a long distance runner and an excellent cricketer. In Toronto he was an active member of the University Company of the Queen's Own Rifles. At McGill he established in 1883 the McGill Cricket Club, and in later years became President and Captain of the Royal Montreal Golf Club (1903-1907). He was chosen President of the Royal Canadian Golf Association in 1907, and at the Canadian Senior Golf Association Tournament in 1918 won the cup presented for the best net score.

On the occasion of his retirement, now almost two years ago, he was presented by his friends in the university at a dinner held in his honour, with a portrait of himself. This portrait now hangs in the Arts Faculty Room. A. D. BLACKADER

The late Professor Ruttan very early in his life gave an indication of his interest in chemistry by his standing in the subject in the last three years (1878-81) of his undergraduate course in the University of Toronto. Inspired by the then Professor of Chemistry, W. H. Pike, who had received his training in chemistry in Germany, and who in his lectures dealt with the subject in an advanced fashion, young Ruttan developed an enthusiasm for it that remained to the end. When, therefore, he entered McGill University in 1881 as a student in medicine he gave, under Professor Girdwood, special attention to chemistry in relation to its medical application and won distinction therein in the class lists. On graduation from McGill in 1884, because of the flame thus lit on the high altar, it was inevitable that he should wish to specialize still further in chemistry. To that end he spent two years in Berlin where the teaching of chemistry, under Professor A. W. Hoffmann, one of the four outstanding chemists of that time, was ex-

emplified as it was nowhere else then. He thus, after nine years in all, had a training in the science that very few of the students of chemistry of his day had undergone.

Appointed Lecturer in Chemistry in the Faculty of Medicine in McGill in 1886 and Professor of Practical Chemistry in 1894, he proved himself to be an inspiring exponent of the subject. In his lectures, he, the first of his day in Canada to do so, expounded the new concepts then advanced, which revolutionized the science, and thus gave a character to his teaching which was maintained to the end. He was not a specialist in the cynical sense of that term, that is, "one who knows more and more about less and less," for his knowledge extended equally over the whole field of the subject and included Physical Chemistry, Organic Chemistry, Mineralological Chemistry and Industrial Chemistry. He devoted from the first all his spare time—and there was not then much of it because of the burden of lectures and laboratory instruction—to research in organic chemistry, and achieved important results in the synthesis of new amines, new fats and alkaloids. In his later years his researches were on the physical and chemical constants of the higher fatty acids and their esters, a subject on which, had he lived longer he would have employed all his spare time.

He achieved much and won recognition for it. Appointed to the Directorship of the Chemical Department in McGill in 1912 he developed it to such an extent that it now as a Graduate School of Chemistry excels that of any other in Canada. His standing as an expert in Industrial Chemistry won for him the Presidency in 1921 of the Society of Chemical Industry of Great Britain. He was President of the Royal Society of Canada in 1920, to the Fellowship of which he was elected in 1895. Because of his attainments and achievements in chemistry the University of Toronto in 1914 conferred on him the Honorary D.Sc. degree. In 1924 he was appointed Dean of the Graduate Faculty of McGill, a position to the duties of which he assiduously applied himself and as a result elevated the standing of the Faculty.

Dr. Robert Fulford Ruttan
(From a painting by Alphonse Jongers)

And now, with the memory of him remaining to all and to the writer of these lines, a friend of his for fifty-two years: Ave et Vale! A. B. MACALLUM

AN APPRECIATION FROM DR. H. M. TORY, CHAIRMAN OF THE NATIONAL RESEARCH COUNCIL

The late Prof. R. F. Ruttan was one of the charter members of the Honorary Advisory Council for Scientific and Industrial Research, now better known as the "National Research Council of Canada." Dr. Ruttan was appointed a member of the Council at the time of its establishment in 1916, and served continuously from that time until the term of his appointment expired, only a few months before his death.

Dr. Ruttan took a keen interest in all phases of the work of the Council, and, notwithstanding his heavy duties and responsibilities at McGill University as Head of the Department of Chemistry and Dean of the Graduate School of that institution, he found time to give generously of his energy and experience in connection with the Council's activities. As Chairman, for many years, of the Associate Committee of Chemists of the National Research Council, he took a leading part through the Committee in keeping the Council constantly in touch with new developments and important problems demanding attention in the field of chemistry. He also served from time to time as chairman of various special committees, such as the Special Committee on Industrial Alcohol, in which capacity he was frequently called upon for advice by the Department of National Revenue at Ottawa, and he gave unsparingly of his time and ability in connection with the work of the Standing Committees of the Council dealing with Post-Graduate Scholarships and Assisted Research Grants.

When the Chairmanship of the Council became vacant early in 1921, Dr. Ruttan was appointed to the post and occupied that position in an honorary capacity for a period of more than six months. Unfortunately, he found that the duties of this appointment demanded more time and attention than he could spare from his duties at McGill University, and, consequently, he resigned the Chairmanship of the Council in August, 1921, but continued to serve as one of the Council's most active members.

Although, when the Council was first established, the importance of scientific and industrial research was not widely appreciated, Dr. Ruttan, at all times, had a clear vision of the value of research in the development of the industrial life and of the natural resources of Canada. He consistently advocated the establishment of National Research Laboratories as the first essential in enabling Canadian industries to maintain their rightful place in international commerce, and although he did not live to see the completion of such laboratories, he had the satisfaction of knowing, before his death, that the action which he and other members of the Council had recommended for many years had been definitely accepted, and that construction work on the laboratories had actually commenced.

Although Dr. Ruttan had not enjoyed the best of health during recent months, the members of the National Research Council were greatly shocked to learn of his death which they deeply regret.

Dr. Lafontaine Baldwin Powers died at Port Hope, Ont., on February 22, 1930, in his eighty-eighth year. He had practised his profession until within a few weeks of his death.

Dr. Powers was born at Canton, Ont., in 1842, and was of United Empire Loyalist stock. His funeral was characterized by simplicity, but, out of respect for his memory, merchants closed their stores for an hour, and the flag at the town hall was hung at half-mast. The mayor and members of the town council attended in a body. Dr. Powers had practised his profession for more

than sixty-years. Dr. Powers is survived by one son, Lafontaine, Montreal, and one daughter, Miss Jessie, at home.

Colonel James W. Bridges, C.B.E., of Fredericton, N.B., died on February 27th after a few days' illness, following a stroke of paralysis, at the age of 64 years.

Col. Bridges was born at Sheffield, N.B., and educated at the University of New Brunswick. He received the degree of B.A., in 1884, and of M.B.,C.M., at Edinburgh University in 1888. He was Assistant Director of Medical Services, Military District No. 4, Montreal, 1910-1914; Officer Commanding No. 2 Canadian General Hospital, Le Tréport, France; A.D.M.S. Third Canadian Division, Ypres Salient; A.D.M.S. Shorncliffe area, and Dover District; thrice mentioned in despatches; Commander of the British Empire June, 1919; A.D.M.S., M.D. No. 4, Montreal, 1919-1921; Director, Canadian Medical Service, Militia Department Headquarters, Ottawa, Canada.

Dr. John A. Duck, one of the leading physicians of West Toronto and a member of the staff of St. Joseph's Hospital, died following a very brief illness on February 23, 1930, with pneumonia.

The late Dr. Duck was born and educated at Lindsay, Ont., and graduated from the University of Toronto in 1914. The year 1915 he spent as House Surgeon in St. Michael's Hospital, Toronto, after which he engaged in practice on Roncesvalles Avenue, where he acquired and maintained the confidence of many families in the west end of the city. The Carmelite Orphanage will especially miss his kindly and efficient services. He was closely connected with St. Joseph's Hospital in its various interests. He was President of the Clinical Society there for the present year.

Dr. Duck was well known in athletic spheres, having played for numerous teams in hockey and baseball in his younger days, and up to the time of his death was an enthusiastic curler.

He is survived by his widow, formerly Miss Elizabeth Jean Hodgson, and three children—Kathleen, Jean, and Theresa; also by his sister, Miss Marion Duck, a graduate nurse of St. Michael's Hospital.

Dr. Owen William Fares, of Humberstone, Ont., died on February 18, 1930, in his 87th year. Dr. Fares was not in practice.

Dr. William T. Frizzell. The death occurred on March 13th, at Owen Sound, of Dr. William T. Frizzell, after an illness of nearly five weeks from a heart affection. Dr. Frizzell, who was the son of the late George Frizzell, was born in Bognor, where he received his public school education, later attending the Owen Sound Collegiate Institute. He taught school at Holland Centre, and then went to the University of Toronto Medical School, from which he graduated in 1898. He practised for two years at Kemble and then, accompanied by Dr. R. Howey, also of Owen Sound, went to London, England, for post-graduate work, returning with the diploma of Licentiate of Royal College of Physicians and Member of the Royal College of Surgeons. He began practice in Owen Sound in 1902. In 1911 he was married to Miss Olive Henderson of Port Dover, who survives him. He is also survived by his mother, Mrs. Margaret Frizzell, 93 years of age, in Owen Sound; and two brothers, James Frizzell, Owen Sound, and Arthur Frizzell on the homestead at Bognor. Dr. Frizzell was an ardent golfer and lover of all out-door sports.

Dr. James Grant died at his residence, Bracebridge, Ont., on March 3rd, after a long illness. Dr. Grant had been practising in Bracebridge for fifteen years. He leaves one daughter, Alma, a brother, Hugh, and a sister, Mrs. George Grant, of Toronto.

Dr. Adrian J. Menard died on February 1, 1930, at Windsor, Ont., from pneumonia, in his forty-ninth year, after an illness of three days. He graduated from the University of Western Ontario in 1904.

Dr. David Patrick, a well-known physician and surgeon in Montreal, passed away at his home on February 25, 1930, in his sixty-third year. Prominent in local medical circles and with a large active practice, Dr. Patrick is widely mourned and his death comes as a loss to the community in which he served.

Born in Paisley, Scotland, he came out to Canada with his family when six years of age, and he spent the greater part of his life in Montreal. He received his early education at the Royal Arthur School and Montreal High School, later entering McGill University, where he enrolled in the medical course. Graduating in 1896 he served his interneship at the Montreal General Hospital. He also took a post-graduate course at Edinburgh University before returning to this city to take up practice.

Dr. Patrick was on the staff of the Montreal General Hospital for more than thirty years, and was well known at McGill University, where he was a Lecturer in Obstetrics and Gynæcology. He is survived by his wife, née Stella De Kalb; a brother, Robert Patrick, of California; and a sister, Mrs. James Edmunds, also of California. The chief mourners included A. L. Patrick, David Patrick and Dr. Evan Patrick, nephews.

Dr. James Rogers, of Forest, Ont., died on January 20th in his fifty-seventh year. He had been ill for two years with cardiac disease, but had recovered sufficiently to attend to his practice. He graduated from the University of Western Ontario in 1891. After graduation he located in Brucefield, going to Forest eleven years ago. He is survived by his widow, two daughters, and one son, Dudley, in his fifth year at the University of Western Ontario Medical School.

BIRTH-MARKS AS A SITE FOR VACCINATION.—Hansen, since his appointment as vaccination officer in 1885 in his district, has made a practice of vaccinating all the angiomas he found in children coming to him for vaccination, the only exceptions being when the parents refused—a rare event—and when the angioma was situated near the eyes. He has kept records of these vaccinations from 1890 onwards; the average yearly number was about 6. The healthy skin around the birth-mark was scratched, and its surface was very lightly scratched to avoid much bleeding. Among approximately 200 cases thus treated there was not a single instance of troublesome inflammation after the vaccination, the scar of which persisted. In the light of this experience the author challenges a statement by Oluf Thomsen in a recently published book on vaccination in which he says: "Vaccination of birth-marks with the object of making them disappear is absolutely objectionable." Hansen questions the validity of this sweeping verdict, and points out that by his procedure a double advantage is gained—*Ugeskrift for Laeger*, p. 827, September 26, 1929 and p. 16, January 2, 1930.

News Items

BRITISH EMPIRE

Shernfold School, Ottawa

The Canadian Council on Child Welfare, through its Executive Secretary, Miss Charlotte Whitton, has sent the *Journal* the following interesting account of the Shernfold School at Ottawa, to which we are pleased to give publicity. More institutions of this kind are sorely needed. This one is small, but will, no doubt, grow. Physicians will be glad to know of the work being done by the Shernfold School, for they are likely to be consulted about cases for which this kind of institutional supervision is desirable. We cordially commend the school.—[ED.]

Shernfold is a residential school for girls of retarded mental development, established under the auspices of the Canadian Council on Child Welfare, and staffed by the Sisters of St. John the Divine, (Church of England). The Board of Trustees is composed of men and women who are prominent in educational and welfare work in Eastern Canada.

The school, which was opened in September, 1927, provides accommodation for fifteen pupils. The age limit is from six years to adolescence with special consideration for unusual cases outside this range. Preference is given to children from eastern Ontario, but pupils will be received from any part of the Dominion, provided a vacancy exists.

The teaching staff of the school consists of three Sisters, who are graduate teachers, with training in the field of Special Education. A graduate nurse, who is in residence, not only looks after the health of the children but gives instruction in health habits and personal hygiene.

The curriculum is adjusted to meet the needs of the individual child, and varies from the pre-school training of the very young child to modified grade work with the older girls. Besides the usual academic subjects, special attention is paid to speech correction, and to vocal and instrumental music, as well as to the various arts and crafts, including drawing, painting, needlework, basketry, weaving, and simple toy-making.

In addition to the above mentioned training, the children are carefully guided in the formation of good habits and socially acceptable conduct. They are carefully supervised, but are given ample opportunity to use their initiative and are encouraged to develop any latent talents and thus build up a pleasing personality. A visitor to the school is at once impressed with the happy home atmosphere and lack of restraint which prevails there.

The grounds are equipped with suitable apparatus for physical training and for various sports and games, and a large playroom on the top floor affords ample space when inclement weather keeps the children indoors.

A child may enter at any time provided there is a vacancy. A complete physical and psychological examination is required before admission, and careful medical and psychiatric supervision is given during residence by visiting specialists in these fields. Diet and physical health are given special consideration in their relation to mental health, and everything possible is done to build up healthy bodies—all physical handicaps being removed or corrected as far as possible.

The school is kept open during the whole year, though the regular school classes are suspended during the summer months, and the time given over to play in the garden, to trips to the country, and to places of interest in the vicinity. It is a hope of the Board of Trustees that in the near future they may acquire a country home, where the older girls will find interest and healthful employment in gardening, poultry raising, and similar occupations.

A day in the life of a child at Shernfold is made up of work, study, and play and begins at seven o'clock, when the children are called by a Sister or Novice. Dressing and the care of the rooms keeps them busy until breakfast time. After breakfast the children finish tidying their rooms, and at nine o'clock assemble in the chapel for simple prayers, scripture reading and singing. The school is non-denominational in its administration and children of all creeds join in the simple devotional services which form an integral part of its daily life. After chapel the business of the day begins with lessons, and household duties, assigned to the children in small groups. A half-hour's recess is spent in the open air, unless the day is stormy, then more lessons, until noon brings the dinner hour. Immediately after dinner each child retires to her room for an hour's quiet rest. Following this, all who are old enough go to the workshop, where they spend a period in handwork of various kinds. A romp in the garden is followed by dressing for tea. The evenings are spent pleasantly in story-telling, reading, singing, or playing games. By eight o'clock all, except a few of the older girls, are in bed and lights are out.

Shernfold seeks to fill a niche in our educational system by providing facilities for the carefully supervised training of girls of school age, who, because of mental or temperamental handicaps, have difficulty in adjusting themselves to the usual school methods. The whole aim of the school is to develop and train these girls so that they may eventually return to their homes, prepared to play their part as members of the family and of the community in which they live.

All further information about this school may be obtained from Miss Charlotte Whitton, M.A., 406 Plaza Building, Ottawa.

Annual Meeting of the Canadian Social Hygiene Council

The next annual meeting of the Canadian Social Hygiene Council will be held from April 30th to May 2nd, inclusive, in the Royal York Hotel, Toronto. Last year's meeting was in Montreal, during the month of June, in conjunction with those of the Canadian Medical Association and the Canadian Public Health Association.

The reports and discussions will centre around three subjects—Health Insurance, Venereal Disease, and Periodic Health Examination. It is expected that a good many national organizations will be represented at the meetings, since the Council is made up of representatives of existing national groups in addition to those of its own provincial and local branches.

To date the following organizations have appointed representatives:— Canadian Association of Child Protection Officers; Association of Canadian Clubs; Canadian Federation of Women's Labour Leagues; National Council of Women of Canada; Royal Architectural Institute of Canada; Canadian Medical Association; United Farmers of Canada; National Council Young Men's Christian Association; National Council of the Young Women's Christian Association; Canadian Manufac-

turers Association; Trades and Labour Congress of Canada; Knights of Columbus; University of Montreal; Canadian National Safety League.

Addresses on the various phases of health insurance will be given by Prof. McMillan of the Minimum Wage Board, Mr. James Simpson, vice-president of the Dominion Trades and Labour Congress, Mrs. H. W. Macdonnell of the Canadian Manufacturers Association, and Dr. Harris McPhedran, the last three giving, respectively the attitude of Labour, the Manufacturer and the Medical Profession.

Indian Medical Degrees

The British Medical Council has refused to recognize the medical degrees of Indian Universities. Owing to the different standards of civilization in Great Britain and India, it is felt that the Indian Universities do not reach the qualities of scholarship and ideals that are desired. Recognition of the Indian degrees would mean admission to practice in Great Britain and the Indian Medical Service.

For a long time efforts have been made to raise the standard of medical education in India and to establish a central body to regulate it. The latest proposal, sponsored by the Government of India, provided for the appointment of a medical commissioner to ensure uniform training throughout India. The Legislative Assembly, however, rejected the plan, and now the General Medical Council of Great Britain has refused recognition.

Doctor's Consulting Rooms at Chemists' Shops in South Africa

The following resolution passed by the Associated Pharmaceutical Societies of South Africa was submitted at the annual meeting of the South African Pharmacy Board, held at Bloemfontein, on January 15th: "That the Medical Council and Pharmacy Board be asked (a) to take steps to prevent medical practitioners from having consulting rooms attached to chemists' shops, and displaying their name-plates on the chemists' premises; (b) to debar the use of prescription pads and envelopes which have the name and address of a chemist printed thereon." The Registrar explained that the Board at its last meeting decided to ascertain the views of the Medical Council on the subject. This was done, and the reply of the Medical Council was to the effect that it was not prepared to do anything in connection with the first point. With regard to the second, the Medical Council had decided to make it one of the matters which would be liable to the Council's disciplinary powers. Mr. J. Christie, M.L.A., the Chairman, announced that the Bloemfontein chemists had notified him that they were opposed to the Board taking any steps relative to the question of consulting rooms and name-plates of medical practitioners attached to chemists' premises on the ground that the matter rested with the Medical Council. After discussion it was agreed to notify the Associated Pharmacy Societies that the Board "considers both practices undesirable." It realized that the first-mentioned practice was one of very long standing, but considered that it would in time die out of its own accord. With regard to the second practice, the Board would like to see this cease at once.

A Nurse Honoured

Nurse Dorothy Cherry, the Englishwoman who first gave medical aid to sufferers in the Burin disaster of November 18th, when 27 lives were lost, was honoured on her return to St. John's, Nfld., when Lady Middleton, wife of the Governor, presented the heroic nurse with a silver clock on behalf of the Newfoundland Outport Nursing and Industrial Association.

GREAT BRITAIN

The Marie Curie Hospital

The systematic treatment of cases of uterine cancer by radium has been carried on by the Cancer Research Committee of the London Association of the Medical Women's Federation for more than four years. The clinic as originally organised was attached to four hospitals, namely, the Royal Free Hospital, the South London Hospital, the Elizabeth Garrett Anderson Hospital, and the New Sussex Hospital, Brighton, but through the generosity of the public a new hospital, called the Marie Curie Hospital, was opened last August at No. 2 Fitzjohn's-avenue, near Swiss Cottage, London, N.W., in order that the work might be centralized and expanded. The four original hospitals still remain in co-operation, however. The scientific advisory council of the new hospital consists of Sir Walter Fletcher, Prof. E. H. Kettle, Prof. Sydney Russ, Sir Charles Sherrington, and Sir Cuthbert Wallace. The research work is being carried out under the direction of the Cancer Research Committee.

Hempstead Church Tower
A Memorial to William Harvey

The mortal remains of William Harvey, the great exponent of the experimental method in biology and the founder of modern scientific medicine, lie in a sarcophagus in Hempstead Church, Essex, to which they were transferred in the year 1883 from the Harvey vault beneath the church at the cost of the Royal College of Physicians of London. Hempstead Church, a fourteenth-century church of very considerable interest, was closely linked with the Harveys, and contains several memorials to other members of the family who achieved distinction in many branches of human activity.

This church must always make a very special appeal to all connected with the profession of medicine, since it is the place of burial of one who rendered not only in his own time but for all time the greatest service to medicine, by establishing it on a secure foundation, and also by inculcating the method by which its progress and development could best be furthered.

On January 28, 1882, the tower of this ancient church collapsed, and the heap of ruins remains in the churchyard to this day, imparting to the surroundings an air of desolation that must be seen to be appreciated.

Upwards of £1,000 have been collected towards the £5,700 required to meet the estimated cost of rebuilding the tower with the old materials. This appeal is addressed by the Committee to the medical profession of the British Empire, in the hope that the sum required to restore the tower may be obtained with as little delay as possible, and so enable a suitable memorial to be raised to the memory of Harvey by those best qualified to appreciate the greatness of his achievement and the service he rendered to humanity.

Donations should be made payable to the Harvey Memorial Fund, and may be sent to Dr. Arnold Stott, 58 Harley Street, London, W.1, who is acting as joint honorary secretary with the Vicar of Hempstead.

The Hickman Memorial

An appeal was launched about a year ago to recognize and perpetuate the memory of Henry Hill Hickman,

a pioneer in general anæsthesia by inhalation. Thanks to a generous response from individuals and societies the Committee was able to make the following arrangements. A memorial tablet, designed and executed by Mr. Eric Gill, was unveiled in Bromfield Parish Church, near Ludlow, on April 5th, being the centenary anniversary of Hickman's burial. His grave in the churchyard was restored, and the tombstone re-lettered. Also, a memorial medal with an endowment fund will be awarded for original work in connection with anæsthesia. In addition, it is hoped to arrange for a portrait of Hickman to be presented to the Royal Society of Medicine. Finally, Mr. Henry Wellcome has made a valuable collection of memorabilia connected with Hickman, which were demonstrated at a meeting which commemorated the anniversary of Hickman's death.

Hickman, who was born in 1800, was, undoubtedly the discoverer of the principle of anæsthesia by inhalation, but, as with so many innovators, he was unable to establish his ideas and observations in the face of prejudice and apathy. Fuller accounts of this meritorious, but almost forgotten, personality, can be found in the *Lancet*, for December 8, 1928, p. 1195, and in the *Canadian Medical Association Journal*, **20**: 178, February, 1929.

Dr. Florence B. Lambert Heads the New Public Health Committee

Another English woman has been given one of Britain's biggest jobs. Dr. Florence Barrie Lambert has been appointed head of the public health committee, which will be responsible for the infirmaries and hospitals and institutions previously administered by the London Boards of Guardians. The latter were abolished on April 1st last. She will also be responsible for London's ambulance services, in addition to controlling 100 hospitals, with 75,000 beds, having an expenditure of approximately $200,000,000.

NOVA SCOTIA

The Kentville Hospital Association has finally made its decision regarding the location of their proposed new hospital. It will be placed on the site of the old exhibition building on ground donated by Mr. George E. Calkin, of Kentville. There is one very great advantage in this location, namely, its close proximity to the Nova Scotia Sanatorium, with its excellent x-ray facilities. It is expected to erect a hospital with "25 bed capacity at a cost for construction and equipment of $75,000."

In view of the somewhat extended waiting list of persons desiring admission to the Provincial Sanatorium at Kentville, chiefly during the fall and winter months, it is welcome news that an infirmary of 100 beds will be erected in the immediate future.

Westwood General Hospital held its annual meeting in January of this year, when Dr. Lalia B. Chase, of Wolfville, the Secretary-Treasurer, submitted the report of eight months' activity. It will be remembered that on May 31, 1929, this hospital was taken over by the community from Dr. C. E. A. deWitt, who had conducted it for a number of years as a private institution. The statistical records for this period show that the hospital has been running very closely to full capacity, the total hospital days being 1,799, for the eight months.

NEW BRUNSWICK

A meeting of the Saint John Medical Society, held on Wednesday, March 5th, at the General Public Hospital, took the form of a symposium on bone grafts. Dr. G. G. Corbet reported a series of bone grafts in cases of non-union of the bones of the forearm; in which he used autogenous grafts from the tibia. In none of these cases was there any infection. Nevertheless, the results were not entirely satisfactory. This was the reason Dr. Corbet exhibited his results. A discussion was opened by Dr. V. D. Davidson who presented a small series of his own. He was followed by Dr. D. C. Malcolm and Dr. A. S. Kirkland. A considerable amount of discussion followed from a group of surgeons. At the meeting a motion picture film was shown, describing the surgical treatment of peptic ulcer. This film was loaned by the firm of Davis & Geck, and its perfections were much appreciated by a large audience.

Dr. H. A. Farris, who has been superintendent of the Saint John County Tuberculosis Hospital since its organization, resigned in February and has lately sailed for Europe where he will spend a year in post-graduate study.

Dr. Farris was the recipient of several presentations from the staff and various tuberculosis organizations in the city previous to his departure. During his long term of office as superintendent, he has seen this hospital grow from a very small beginning, fifteen years ago, to the present large, well equipped and successful institution which it is to-day. The most recent addition to the hospital was the Nesbitt wing for children which has only recently been opened. Dr. Farris' successor has not yet been appointed. Dr. Perry Knox is acting superintendent in the interim.

Dr. M. A. Oulton, Shediac, a member of the local Legislature, has been confined to his home by illness for some time. It is reported that he is now somewhat improved and expects to be able to resume his practice and legislative duties in a few days.

The extra-mural meetings for March were held in Moncton, Saint John, Saint Stephen and Fredericton. The team this month was supplied from the teaching staff of Dalhousie University, Halifax. Dr. E. K. MacLellan spoke on two subjects: first, "Breach presentations," which address was illustrated by a motion picture film; the second portion of his address covered some of the debatable points in the treatment of eclampsia. Dr. MacLellan's addresses were practical and interesting. However, the film which he exhibited aroused a fair amount of criticism from obvious defects in obstetrical technique, rendering a rather good photographic result indifferent as a teaching vehicle. Several of the members, in discussion, recommended that the film be withdrawn on account of these glaring faults.

Dr. MacLellan was followed by Dr. Norman S. Gosse. Dr. Gosse presented a very thorough synopsis of the current opinions on the cancer problem and made a plea for more active measures in the fight against cancer by local and provincial authorities. Dr. Gosse's paper was an example of polished literary effort, being as finely a prepared paper as it has been our pleasure to hear lately. His criticism of the Canadian attitude towards cancer may, possibly, have been considered slightly too severe. Nevertheless, this may have been due to Dr. Gosse's enthusiasm in this interesting branch of medicine.

A. STANLEY KIRKLAND

QUEBEC

It is announced that the Medical Association of the Province of Quebec will hold its annual meeting in September next, in Montreal, simultaneously with that of the Congrès des Médecins de Langue Français de l'Amérique du Nord. This will be an excellent opportunity for the English speaking medical men to get in touch with their confrères of the French tongue. Membership in the Quebec Association can be obtained by regular and reputable physicians for the small sum of $3.00 a year. All are urged to join. Subscriptions can be sent to the Secretary, Dr. Léon Gérin-Lajoie, 3553 Park Avenue, Montreal. It is expected that some of the visitors to Winnipeg from England will be present in Montreal and will address both the Congrès des Médecins de Langue Français and the Provincial Association.

During the past year the Medical Association of the Province of Quebec has been incorporated, thus obtaining legal standing.

Scarlet fever accounted for the largest proportion of patients admitted to the Alexandra Hospital for contagious diseases, during 1929, according to the report made by Dr. A. D. Blackader, President, at the annual meeting on March 6th. Of the 1,668 patients admitted to the hospital during the year, 1,057 were suffering from scarlet fever, which proved to be of a more malignant character last year than during 1928. Serum was injected promptly when the temperature rose above 100 degrees and was found of great assistance in fighting the disease. A total of 19 deaths from this fever occurred during the year.

The gross mortality for the hospital during 1929, was 73, or 4.3 per cent, which, if those patients brought into hospital in a moribund condition, are excepted, brings the percentage down to 2.4 per cent. This rate is a tribute to the efficiency of the staff and internes.

There was a diminution in the number of diphtheria cases during the last year, although the disease took a virulent form. Cases admitted to the hospital totalled 338 with 40 deaths, 28 of which were admitted in a moribund condition. The report expressed the thanks of the officials of the hospital for the serum supplied by the City Health Department to such families as could not afford to pay for it, mentioning also with an expression of pleasure the diphtheria clinics lately established in the city.

Cases of erysipelas numbered 114, 8 of whom died; measles, 70, with 3 deaths; whooping cough, 51, with 1 death; and there were 23 cases of chicken pox and 14 of mumps.

Dr. Blackader emphasized the need for enlarged accommodation at the Alexandra Hospital, stating that it is practically the same size as it was when built twenty years ago, while Montreal has grown out of all proportion to its capacity. Last year alone showed an increase of 262 patients over the year before, and it is absolutely essential that the hospital for contagious diseases be enlarged.

At the annual meeting of the Verdun Protestant Hospital, held on March 6th, the need for expansion was emphasized. The directorate finds itself forced to make an appeal for money to the Protestants and Jews of the community. This decision was reached after the realization that there would be a necessary expenditure of $250,000 to $300,000 during the current year.

It is proposed to continue during 1930 on the same lines, using all available space, but in 1931 at least one new building will be required for patients, and the increased demand will force increased accommodation for the nurses and other help. At one time, during this year, 913 patients were housed in buildings designed to accommodate 680.

The principal report covering the activities of the year 1929 was read by Dr. C. A. Porteous, Medical Superintendent, as follows:—

"As the hospital on December 31, 1929, had completed almost forty years of existence—39½ to be exact—in its service to members of the Protestant, Jewish, or other non-Catholic religions in Quebec Province (though, when in July, 1890, it opened its doors, neither the second nor the third-named beliefs were numerically strong), you might be interested if told that during that period lasting two generations, 7,640 non-Catholic patients, mostly your co-religionists, were admitted; of these 3,781 were discharged, or 49 per cent, more than 33 per cent recovered, and 16 per cent improved, many of the latter undoubtedly progressing to complete restoration.

"The total number of patients under treatment in the year was 1,146. There were admitted 296 patients in the period referred to, strangely enough, exactly 148 of each sex; this averages more than five patients a week the year round, and is the highest admission rate the hospital has known."

W. Mayne McCombe, Honorary Secretary, who presented the financial statement, said that last year's receipts were $322,971, and expenditures totalled $335,218. In 1928 he said; there was a deficit of $7,894. The capital account was increased during the year by receipts of legacies totalling $8,700, while an additional $5,000 was received from the estate of the late Moses Michaelsom.

At the thirty-sixth annual meeting of the Homœopathic Hospital of Montreal, held recently, it was announced that an appeal would be made to the public for the sum of $300,000, to provide enlarged accommodation in the hospital for children.

In his report, Dr. A. R. Griffith, the Superintendent, said, "The hospital is greatly in need of better accommodation for children. Under present conditions no relief is possible. A new nurses' home would give the necessary rooms to accommodate 20 children, and if the hospital is to grow and become useful the nurses' home must be built.

"To provide proper care for public patients without a yearly deficit, we should have an endowment fund of at least $210,000. This method of hospital administration is recognized as the proper one in all modern institutions. No effort should be made to cover deficits from the professional departments; rather should money be voted for research and original work. The income from public patients was $10,023. The cost of caring for these patients was approximately $40.000."

Dr. Griffith's report showed that a total of 2,720 patients were treated during the year, which represented 30,268 patient-days. These were divided into 961 public patients, 729 private and 958 semi-private patients. Ninety deaths were reported during the year. Excluding the still-born and those who died within 24 hours after admission, there were 45 deaths, which gives a low mortality rate of 1.7 per cent.

The official opening of the first Canadian Army Medical Corps officers' mess took place on March 6th at their quarters, 1215 Greene Avenue, Westmount, with officers from the 6th, 9th and 20th Field Ambulance Corps, and representatives from local units present.

Brig.-Gen. H. S. Birkett, of the C.A.M.C., spoke, telling of his satisfaction, as one who had a hand in starting the unit, when he saw into what it had de-

veloped. He said that in order to keep an organization of that nature together, a meeting ground was needed, and now that one had been provided the medical services would once again receive the recognition due them.

Lieut.-Col. C. W. Vipond, D.S.O., officer commanding the 9th Field Ambulance, introduced Lieut.-Col. E. W. Pope, C.M.G., A.A.G., Q.M.G., Military District No. 4, who, on behalf of Brig.-Gen. W. B. M. King, C.M.G., D.S.O., district officer commanding, declared the mess to be formally open.

Brig.-Gen. Birkett, on behalf of the officers, replied to Col. Pope, thanking him for opening the mess. Major Hurtubise, mess president, also spoke for a few moments, and read the excuses of those unable to be present.

The officers of the mess are: Major E. Hurtubise, President; Capt. J. Mackenzie, Secretary; Major W. Bourn, Major E. Faucher and Capt. J. J. Griffith, Directors.

The Knight's Cross of the Order of the White Rose of Finland was presented to Dr. H. E. MacDermot, of the Montreal General Hospital, on March 12th, by Akseli Rauanheimo, Consul-general of Finland in return for the generous medical help Dr. MacDermot has given to Finnish immigrants. The presentation took place at the Finnish Consulate.

In expressing his thanks to Dr. MacDermot for the work he has done, the Consul-general pointed out that even the strong and husky immigrant has to endure many hardships before he is acclimatized and can avail himself of the opportunities Canada offers. If his health fails him, be it only for a short time, he is utterly destitute and the battle is almost lost. He went on to say that Dr. MacDermot was not the only one who had helped immigrants but that the gratitude of Finnish people in Montreal was concentrated on him particularly, and reached through him to other physicians who have not hesitated to help the poor without reward for themselves.

The Order of the White Rose is the only decoration of the country and the President of Finland is the Grand Master of the Order. The crosses are given only in cases of special merit. Dr. MacDermot is the third man in Canada to receive one.

The campaign to raise $1,500,000 in aid of the Notre Dame Hospital will open shortly. This is the first French-Canadian campaign in years, with the exception of the University of Montreal drive of a few years ago.

The money will be used chiefly to erect the completing wing of the hospital. When the hospital was first built, lack of funds forced the builders to leave the eastern wing unfinished, and it is now declared, that owing to congestion it will be necessary to complete it. About 200 beds will be added. Not all of the $1,500,000 will be used in the erection of the new wing. Some of it will be used for other purposes.

Dr. Antonin Belanger, of Lauzon, is the head of the new sanitary unit in Levis, being officially named to the post by the Provincial Health Bureau on March 5th.

The new unit will start functioning early in June, and in order that the personnel may be fully conversant with all details they left for Beauceville on March 23rd, to study the workings of the unit there.

The town of Rimouski led the Province of Quebec for infantile mortality during the month of December, according to statistics issued by the Provincial Health Department, it having a rate of 360.9, made up of 6 deaths out of a total of 23 births.

Sorel, with a rate of 259.3, made up of 7 deaths out of 27 births, is in second place, with St. Jerome, which had 3 deaths out of 15 births for a rate of 200, third.

Urban centres had a bigger percentage for infantile mortality than had the rural sectors, the latter recording 99.2 per cent as against 122 per cent for cities and towns. The general infantile mortality rate for the province during the month was 109.7.

In all there were 733 deaths of children under one year old, out of a total of 3,010 deaths, the general death rate for the province being 13.8 per cent. There were 6,682 births during the month, for a rate of 29.2.

Three places in the province returned a clean bill as regards infantile mortality during the month of December, these being Outremont, Westmount and St. John, while three others, La Tuque, Magog and Montmagny, each had one case.

Montreal's rate for the month was 122.3, there being 196 deaths of children under one year of age, as against 1,603 births for the month.

The highest birth-rate for the month was recorded by Kenogami, which had 30 births, for a rate of 59.9, while Jonquières, which had 46 births, had a rate of 56.4 for second place, and Thetford Mines, with 47 births and a rate of 50.3, third.

Causes of death during the month, were: whooping cough, 32; diphtheria, 57; measles, 26; scarlet fever, 22; typhoid, 8; influenza, 83; pneumonia, 318; pulmonary tuberculosis, 228; other forms of tuberculosis, 37; spinal meningitis, 3; diarrhœa, 103; encephalitis, 1; violence, 87; syphilis, 9; diabetes, 34; heart disease, 349; and cancer, 157.

ONTARIO

The members of District Number Six of the Ontario Medical Association have recently taken a forward step which, if followed by the other Counsellor Districts, will make available to the profession of the province important information which may be of decided advantage to them in time to come.

At the annual meeting of the District, held in Cobourg on September 5, 1929, a Committee was formed, composed of representatives from each of the Medical Societies of the District, to study the problem of State Medicine or Health Insurance as it would apply to this particular section of the province. This committee met at the Royal York Hotel, Toronto, on the evening of January 10, 1930, the following being present as dinner guests of Dr. F. C. Neal, the District Counsellor: Drs. J. A. White, F. A. Logan, J. M. McCulloch, H. M. Yelland, Harold Ferguson, C. W. Slemon, Geo. Stobie, E. A. McQuade, C. V. Mulligan, and T. C. Routley, the Secretary of the Ontario Medical Association.

It was decided that a questionnaire should be prepared by the Committee and sent to every doctor in the District, this questionnaire to embody such information as the following:

Capital expenditure of each doctor, (that is, cost of education, money invested in practice, and reasonable overhead expenses.)

Income.
Amount of free work done.
Medical cost per family attended.
Hospital accommodation, etc.

From the information secured by means of this questionnaire, the Committee felt that they would be in a position to offer some suggestions as to the form of health insurance which would meet the needs of this particular locality.

It was also decided that a careful study should be made of any movements along this line in other countries or other parts of Canada.

SASKATCHEWAN

At a meeting of the Regina and District Medical Society Dr. J. V. Connell, in a paper entitled "Health insurance," gave the following as factors tending toward state medicine; first, increased power of provincial and federal health departments; second, the fact that large corporations are using physicians as medical officers and as a safeguard to themselves; "Who," Dr. Connell asked, "has ever heard of a company doctor giving evidence in favour of an employee?"; third, the friendly societies and mutual benefit clubs who enjoy medical attention at reduced rates; fourth, the establishment of free medical services as inoculation and vaccination, well-baby clinics, and chest clinics; fifth, the fact that during the war a large number of the population were attended by army doctors and since by pension boards. All these factors show the unmistakable trend of practice. He outlined health insurance in Germany and in England. He felt that the modern tendency was to do away with the personal relation of sympathy between doctor and patient, and that soon, instead of being free individuals doctors would be servants of the state or of large corporations. The society that demanded or countenanced this change would be the first to regret the passing of the old time family physician.

The care of the indigent sick from the rural municipalities is a topic that has received much discussion recently in Saskatchewan. Until October, 1928, the rural municipalities considered themselves responsible for the hospital bills only of their indigent sick On October, 1928, Judge Rimmer gave a judgment in favour of Dr. W. R. Coles versus a municipality which paid the hospital bill for an indigent case but refused to pay the doctor's bill; the municipality appealed the case but Dr. Coles won again in the higher court. For over a year the municipalities have paid the doctor's bill in addition to that of the hospital. There has been some discontent on the part of the municipalities about having to part with these sums of money for the care of the indigents. They felt that perhaps an economy could be effected by entering into a contract with one particular city physician to attend all the indigents of a certain municipality when sent to the city for treatment. The feeling expressed at the Regina and District Medical Society was that this was unethical and a resolution was passed instructing the secretary to inform all members that it was the wish of the society that no member should enter into or complete negotiations to attend the sick of and for any municipality without referring the matter to that society. A special meeting of the Saskatchewan Medical Association to consider this question has been requested by the Regina and District Medical Society.

At the annual convention of rural municipalities, held in Regina, Mr. J. J. Smith, Deputy Minister of the municipal department of Saskatchewan, in dealing with the question of the care of the indigent sick, said that much of the dissatisfaction was due to the fact that the patients went to doctors without first consulting the council and the first intimation that municipalities had that they were liable to expenditure was the receipt of a bill from a medical practitioner. He announced that it was the intention of the legislature to deal with this by providing that in future free medical attendance will only be given upon the order ef the municipal council or some person delegated by the council with authority to give such permission. In emergency cases a medical man may be called in for a first visit, but before continuing to attend a patient he must secure the sanction of the council under the proposed amendment.

LILLIAN A. CHASE

ALBERTA

At a recent meeting in Calgary of the committee appointed by the Alberta Medical Association to deal with the problem of cancer in this province, it was stated by Dr. M. R. Bow, Deputy Minister of Health, that there were more deaths from cancer than from tuberculosis in Alberta. In 1928 cancer exacted a toll of 65 lives per 100,000, while tuberculosis gave a death rate of 57 per 100,000. Dr. Bow gave the following statistics of cancer deaths over a four year period:

Region involved	*1925*		*1926*		*1927*		*1928*	
	Male	*Female*	*Male*	*Female*	*Male*	*Female*	*Male*	*Female*
Buccal cavity	14	1	10	1	13	3	11	3
Stomach and liver	93	44	93	50	124	65	118	57
Peritoneum, intestines and rectum	35	20	22	28	37	34	29	37
Female genitalia	..	28	..	34	..	26	..	23
Breast	..	37	..	32	..	32	..	36
Skin	5	1	5	3	6	1	7	4
Unspecified	45	17	51	23	54	25	65	25
	192	148	181	171	234	186	230	185

Dr. Harold Orr, Edmonton, was appointed Secretary of the Committee. The officers of the committee were instructed to secure information as to the necessary supply of radium which will be required for the province, also details as to the best remedial uses to which it could be applied.

The immediate object of this newly appointed committee is to make a study of the question as to the most desirable methods of educating the medical profession and the public on the great importance of making an early diagnosis of cancer. As a means to this end, it was suggested that the matter be called to the attention of our profession and the public through the Provincial Department of Health Bulletins. Furthermore, the Alberta Medical Association post-graduate tours might also be used in this connection. It was decided to have two sections of the Committee, one for the northern part of the province and one for the southern. Dr. W. H. McGuffin was appointed chairman for the southern

part. The committee made the recommendation to the Alberta Medical Association that the chairman be given power to add to the membership of this provincial cancer committee as he deemed best.

As no Osler Memorial Committee was appointed at the last meeting of the Alberta Medical Association, the executive committee of this association at a meeting held on February 12th, appointed the following as members: Drs. Harold Orr, Edmonton; Duncan Smith, Edmonton; W. Merritt, Calgary; W. S. Galbraith, Lethbridge; R. Parsons, Red Deer; T. R. Ross, Drumheller; J. S. Wright, Edmonton; R. O'Callaghan, Calgary; J. N. Gunn, Calgary; J. S. McLeod, Medicine Hat; L. J. O'Brien, Grande Prairie; F. A. Nordbye, Camrose; A. E. Archer, Leduc; F. H. H. Mewburn, Edmonton, Secretary.

In 1928, a special committee was appointed by the Provincial Government to investigate the question of state medicine. This report has been issued and covers some seventy-one pages. The conclusions arrived at were, that a system of state medicine for the Province of Alberta is feasible, but would entail the expenditure of a considerable amount of money. Improvement of health conditions in Alberta would be better served by a system of preventive methods rather than by curative measures. The whole civilized world is investigating the question of state medicine and in some countries considerable progress has been made. The special committee reviewed the experience gained in Canada covering county health units, health insurance and contract medicine. In connection with the situation in other parts of the world, the report points out that the experience in Great Britain with the National Insurance scheme makes clear the danger of imposing extensive state methods of medical treatment in addition to having uncoordinated existing health services. The need of a long range, comprehensive, and co-ordinated scheme of medical treatment and public health activity is emphasized. In France and in Germany, there recently has been a widening of social insurance and state control to cover all contingencies to which the working man and his dependents are exposed.

During the present session of the Provincial Legislature, the labour members brought forward a resolution endorsing state medicine and health insurance but this resolution was defeated. An amendment to this resolution was moved by the Hon. George Hoadley, Minister of Health, advising a continuance of the government's efforts to improve the public health services and further co-operation with the other provinces, and a continuance of its policy of health insurance investigation. This motion was carried. Premier Brownlee expressed his belief that the time was not yet ripe for state medicine in Alberta.

The Hon. G. H. Hoadley thought that every angle of state medicine should be examined thoroughly before any definite move is made, so that everyone can be made conversant with what state medicine actually means, as many people have different ideas as to the exact definition of it. He was of the opinion that many of the things being done in the province at the present time in general health matters were directed towards state medicine. No less than 388 physicians, of which number 44 were full time and 344 part time, are doing government work in Alberta. Last year $269,000 was spent on hospitals and medical aid services by the Workmen's Compensation Board alone.

The estimates of the Provincial Department of Health were passed by the Legislature. These amounted to $1,597,671.15. No new buildings will be erected at the Central Alberta Sanatorium near Calgary. The sum appropriated for this institution for the current year amounts to $222,800.00. New buildings will not be provided at the Ponoka Mental Hospital or at the Mental Hospital at Oliver.

Dr. L. G. Alexander, of Arrow Wood, has disposed of his practice to Dr. E. J. Leisemer, of Crossfield. Dr. Alexander is now practising in Calgary.

Dr. Margaret Falla has resigned from her position as contract physician for the municipality of Belvedere, and has returned home to England.

The members of the Calgary Medical Society listened to an address of exceptional interest on March 4th, by the Right Reverend L. R. Sherman, Bishop of Calgary, on "Personal Glimpses of Sir William Osler, Bart." Bishop Sherman was a Rhodes scholar attending Christ Church College, Oxford, when he first came into intimate contact with Sir William Osler. Like many another, he came under the spell and influence of his wonderful personality. He described the beautiful Lady Chapel at Christ Church with its many historical associations where Sir William Osler was a regular attendant. He also gave intimate glimpses of the life at 13 Norham Gardens, called the "Open Arms", where unbounded hospitality ever reigned, and portrayed vividly the full life which Sir William Osler lead and the profound influence for good he had upon those with whom he came in contact.

Dr. George E. Robbins who has spent the past four years in Europe, in eye, ear, nose and throat work is now associated with Drs. Gunn, Hackney, Shore, and Bowles in Calgary.

Dr. W. H. McGuffin, of Calgary, attended the annual meeting of the Radiological Society of America recently held in Toronto. When in London, Ontario, he addressed the local Medical Society as well as the students of Western Ontario University.

G. E. LEARMONTH

Dr. T. E. Corbett, of Castor, Alberta, has recently returned from taking a course of post-graduate study in New York, Chicago, Montreal and Winnipeg.

Dr. G. M. Ellis, who has been for some time taking up genito-urinary work with Dr. McKenzie of McGill University, Montreal, has recently come to Edmonton and will for the present be associated with Drs. Baker and Sprague in general practice.

Dr. W. W. S. Armstrong, son of Mr. George Armstrong, postmaster, has recently returned to Edmonton after spending four years at Johns Hopkins University and one year in Vienna, since graduation at McGill, and will shortly open an office here where he will practice the specialties of eye, ear, nose and throat.

Dr. A. M. Crawford, who formerly practised at Westlock, Alberta, has recently opened an office in the Tegler Block, Edmonton.

Dr. H. E. Chatham, of Edmonton, is away on a vacation for several months to California. His practice is being looked after during his absence by Dr. A. L. Crawford.

Dr. T. H. Whitelaw, who resigned the position of Medical Officer of Health last year, after a vacation in England and Scotland has resumed the practice of medicine, and has taken the office at 544 Tegler Block, Edmonton, formerly occupied by Dr. J. A. Neff, who has gone to reside in Vancouver.

T. H. WHITELAW

UNITED STATES

The Inter-State Post-Graduate Medical Association of North America

The Sixth Annual Visit of this Association to Europe is announced to take place from May 14 to July 10, 1930. The members sail from New York by the *S.S. President Harding* on May 14th. Clinics and lectures will be held in the following cities: Hamburg, Berlin, Prague, Munich, Vienna, Rome, Florence, Zurich, Berne, and Paris, and for the most part will be conducted in the English language. Arrangements have been made to permit of visits to Oberammergau (to see the Passion Play), to Venice, Naples, Milan, Interlaken, Lucerne, as parts of the approved itinerary.

The price of the assemblies will be $1,150.00 per person on the all-expense plan, including practically everything except passport, visas, tips on board ship, deck chairs and rugs, which will add about $60.00 to the initial cost.

Full information may be obtained from Dr. William B. Peck, Freeport, Ill., U.S.A., or from the travel department of the American Express Company, 65 Broadway, New York City.

International Medical Club of New York

This organization was started by a group of foreign medical graduates residing and practising in the State of New York, with the active participation of prominent American medical graduates interested in the promotion of international medical relationship. The organization of the International Medical Club was justified by the sole fact that, in New York State alone, there are over 4,000 foreign-born physicians and thousands of medical graduates from foreign universities.

The foreign language medical societies in New York are numerous, and are as follows: Two Italian (Manhattan and Brooklyn), a Spanish, German, Russian, Hungarian, Greek, Celtic, and others of less importance. Due to the fact that these foreign language medical societies were functioning independently, with no contact between themselves and the American medical organizations, the International Medical Club, had, as one of its objects, the establishment of relationship between these foreign and American medical organizations.

During the five years of its existence, this organization has met with distinct success in the fulfilment of its numerous objects. Dr. Jacques W. Maliniak is the President, and Dr. Richard Kovacs, 223 East 68th St., New York, is the Secretary.

The Importation of Parrots into the United States

It is reported that President Hoover, on January 24th, forbade the importation of parrots into the United States, with a view to preventing the further extension of psittacosis. Up to the present more than sixty cases of psittacosis have been discovered in the United tSates, with eight deaths. In each case the disease has been traced to parrots imported from South America.

Dust in the Air of Rochester, N.Y.

Some idea of the importance of dust and dirt in the air may be gathered from a laboratory investigation into the amount of suspended matter in the air of Rochester. During the period from November 11 to 14, 1929, an average of 0.207 tons of dirt per square mile fell daily.

The Semon Lecturer

Dr. Harris P. Mosher, Professor of Laryngology at Harvard University, gave the Semon Lecture before the Royal College of Surgeons, London, on December 5, 1929. His subject was "The pathology of the lower end of the œsophagus." On the same occasion Dr. Mosher received the Semon Medal.

The Physicians' Art Club

The fourth Annual Exhibition of the Physicians' Art Club was held at the Academy of Medicine, New York, from February 15 to March 15, 1930. The handiwork of physicians, of many kinds, paintings, etchings, sculpture, and the various crafts, were on exhibition.

Dr. Joseph C. Bloodgood and Dr. Russell L. Haden

The medal of the Radiological Society of North America has been presented to Dr. Joseph Colt Bloodgood and Dr. Russell L. Haden for outstanding work in the field of radiology.

GENERAL

Second International Pædiatric Congress, Stockholm, August, 1930

Their Royal Highnesses, the Crown Prince and the Crown Princess of Sweden have graciously promised the convention their patronage.

On special request from several quarters, the date of the convention has been put forward one day, and the new dates are thus August 18—21, 1930.

Acting on suggestions received from the national committees of the different countries, the Swedish organization committee has chosen the following subjects for discussion:

The biological effect of direct and indirect ultra-violet irradiation.

The physiological and pathological significance of the thymo-lymphatic system.

The psychology and patho-psychology of childhood; their significance as a branch of pædiatric research and teaching, and their application in medico-social work.

The fee of admission is 20 Swedish crowns for regular members, and 10 crowns for members of their families.

Following the convention, three pleasure trips are planned for those visiting the convention:

(a) Stockholm—Dalecarlia (Falun, Lake Siljan)—Gothenburg or Stockholm. Duration of trip, about two days. Price 120 crowns, covering second class railway accommodations, board and lodging, guides and tips.

(b) Stockholm—Jämtland—Trondhjem—Stockholm. About 3½ days. Price 225 crowns (if the trip is terminated at Trondhjem, 180 crowns), covering second class railway accommodations with sleeping cars, board and lodging, excursions, guides and tips.

(c) Stockholm—Visby—Stockholm, air route, One day. Price 150 crowns, covering meals, automobile excursions on the island of Gotland, guides and tips.

Reservations should be made as soon as possible (not later than July 1st), and be accompanied by a deposit of 50 crowns.

The Swedish State Railways Travel Bureau has a branch office in New York: Swedish State Railways Travel Information Bureau, 551, Fifth Avenue. Telegraphic address—Swedtravel.

All communications should be addressed to *The Second International Pædiatric Congress, Stockholm, Sweden.* Telegram address: *Pædiatric, Stockholm.*

Applications for tickets of admission should preferably be accompanied by the fee, sent by cheque or money order.

For the avoidance of errors, it is absolutely necessary that all names and addresses be written with printed characters or typewritten.

Stockholm, January, 1930.

I. JUNDELL, M.D.,
Chairman Swedish organization committee.
Nils Malmberg, M.D.,
Secretary Swedish organization committee.

International Neurological Congress: 1931

Plans for the International Neurological Congress of 1931, of which Prof. B. Sachs, of New York, is President, have been prepared by the Program-Executive Committee of all the countries interested in the organization of this Congress, and, according to the present arrangements, the sessions will take place in Berne, Switzerland, from August 31st to September 4th. Membership in the Congress will be open to all neurologists, psychiatrists and neuropsychiatrists of the world. It is limited only in the sense that those who wish to become members shall belong to some national or local neurological, psychiatric, or neuropsychiatric association or society, and shall secure endorsement of their application by the secretary of such association or by some neurologist or psychiatrist known to the Committee.

The membership fee for the Congress has been fixed at $5.00, which will not include a copy of the Transactions. Copies of the Transactions will be supplied to all those who desire them, at a price which will be decided upon later.

It is the hope of the Canadian Committee that a representative group of Canadian participants will attend the Congress. If you wish to enroll as a member of the Congress make application to the Secretary of the Canadian Committee, Dr. W. V. Cone, Royal Victoria Hospital, Montreal, at your earliest convenience.

Thomas Cook and Son have been appointed by the Program-Executive Committee as the official transportation agents for the Congress and they have already made arrangements, through the French line, for a group-sailing on July 30, 1931. They have also prepared a most attractive itinerary with two alternatives—one including Belgium, Holland, the Rhine, Munich and Switzerland—the other one western and southern France, northern Italy and Switzerland, with a return group-sailing on the same or a similar vessel of the French line, from Havre, on September 8th or 9th, to reach New York about September 16th.

The tentative program for the congress is as follows:

1. Diagnostic and therapeutic procedures (surgical and otherwise) in brain tumours. Morning and afternoon sessions of Monday, August 31st. Program to be arranged by Professor Nonne. Reports (tentatively suggested) Sir James Purves-Stewart, Cushing, Trotter, Vincent, de Martel and Foerster.

2. Muscle tonus, anatomy, physiology and pathology. Morning session of Tuesday, September 1st. Program to be arranged by Sir Charles Sherrington. Reporters (tentatively suggested) von Economo, Ramsay Hunt, Rademaker, Wilson, Thevenard.

3. Acute non-suppurative infections of the nervous system. Morning session of Thursday, September 3rd. Program to be arranged by Professor Guillain. Reporters (tentatively suggested) Marburg, Buscaino, Greenfield, Marinesco, Pette, André-Thomas, van Bogaert, Wimmer.

4. The rôle of trauma in the production of nervous symptoms, Morning session of Friday, September 4th. Program to be arranged by Professor Rossi. Reporters (tentatively suggested) Charles Symonds, Del Rio Hortega, Lhermitte, Jelliffe, von Sarbo, Veraguth.

Except for Monday, the afternoon session of which is to be devoted to the further consideration of brain tumours, the afternoon programs will be composed of papers on miscellaneous topics. Members of the Congress wishing to present titles for the consideration of the Program Committee should forward them to the Secretary-General, Dr. Henry Alsop Riley, 117 East 72nd Street, New York City, at their earliest convenience.

COLIN K. RUSSEL, M.D.,
900 Sherbrooke St., W., Montreal,
Chairman of Canadian Committee.

The Third Post-Graduate Course on Cancer

The Faculty of Medicine of the University of Strasbourg announces that the third post-graduate course on cancer will be held at the university and the Anti-Cancer Centre in Strasbourg from July 16 to 26, 1930.

The courses of study offered are both theoretical and practical, and will include methods of treatment by physical agents, such as, x-ray, radium, and diathermo-coagulation. Living cases will also be demonstrated. The number of post-graduate students accepted will be limited, and at the end of the course a certificate will be given to those attending. The fee is 500 francs.

All necessary information can be obtained from Dr. Gunsett, Director of the Anti-Cancer Centre, Civil Hospital, Strasbourg, France.

Rioting at the University of Vienna

Some regrettable incidents have taken place recently at the University of Vienna, which have seriously disturbed its work. Incited by political agitators, who, unfortunately, had enlisted the sympathy of some of the professors, certain groups of students staged demonstrations against several of the instructors, on the ground that these did not favour the German National Movement. Dr. Tandler, the Professor of Anatomy, seems to have been the target for the more serious attacks, and his lecture room and institute were badly damaged by the rioters. There were other disturbances elsewhere in the university, and, unfortunately, a number of foreign students were roughly handled. As a consequence the university was closed by the authorities for several days, although, with the exception of the anatomical, physiological, and chemical institutes, the work of the medical faculty was carried on as usual. The government has ordered a thorough investigation.

Broadcasting and Medical Practice

A somewhat curious judgment was lately given by a law-court in Karlsruhe. An engineer, being disturbed during listening-in by rattling in his wireless set, ascertained that this was due to high-frequency currents coming from diathermy and x-ray apparatus of a neighbour who was a medical man. He therefore asked for an injunction, an action requiring that the latter should be prohibited from using this apparatus. Although it did not entirely agree with the plaintiff's demand, the court ordered the medical man not to use his apparatus between 12.30 and 2.30 p.m. or between 8 and 12 p.m., under penalty of an imprisonment not exceeding 6 months and a fine. This judgment has

caused some astonishment in the profession. A medical journal asks whether the doctor should be prohibiteed, for instance, from using x-rays at these hours to ascertain the presence of a foreign body—in order that the plaintiff may be able to hear operatic melodies or dance to the tunes of the broadcasting orchestra. The defendant has, of course, appealed to a higher court, requiring annulment of the judgment.

The Parrot Question

In view of the death of two persons from psittacosis, the government of the Netherlands has destroyed a shipload of parrots which arrived on February 19th from South America.

La Documentation Médicale

This is a new journal, the first number of which, that of January, is before us. Its object is to bring out every month the scientific production of the world in connection with medicine and the related sciences. In short, it is an index medicus in convenient form. The authors' names are arranged alphabetically under appropriate headings; the titles of the papers; the number of words in the papers; and the full reference to the journals in which they appear are given in detail. At the end of the number a list of the journals referred to is given, and, also, a list of authors' names. An interesting feature is that the journal will send, on request, the original or a copy of any article cited.

The price of the journal is 100 francs for France, and 125 francs for other countries. The editorial offices are at 2 Square Desnouettes, Paris XV, France.

Special Notice re Collection Agencies

Members of the Canadian Medical Association who are in possession of definite information or evidence to prove that they have been mulcted of moneys at the hands of collection agencies or bureaus are requested to send this information to the General Secretary at once. The Law Society of Ontario has kindly consented to look into this question, and it is very important that any evidence which we may possess should be placed in the hands of that society.

Book Reviews

Psychology—Normal and Abnormal. James Winfred Bridges, Ph.D., Professor of Psychology in the Faculty of Medicine, McGill University. 552 pages; price $3.50. New York and London. D. Appleton & Co.

"It is necessary at the present time to weigh opinions and to attempt a reconciliation of divergent views on many topics. The truth is more likely to be found in such a reconciliation than in the prejudiced opinions of the extremists." Were not Dr. Bridges a very modest man, he might very well place the above quotation on the fly leaf of future editions of his book. It is taken from the book itself and one believes that it accurately states Dr. Bridges' objective in preparing this work.

Of late years pronouncements on psychology have reminded one very much of the confusing statements issuing from a crowd in which everyone seems to think he has something to say and every one talks at once. No one doubts the importance of the subject, but for those who from interest or necessity must listen there is only too often confusion and despair and a longing for someone who will give a well balanced résumé of the whole thing.

Psychology in medicine is rapidly approaching its true status as a subject of fundamental importance to medical students and practitioners. It has at last found a place in the curricula of most medical schools. The time devoted to it is not long and instructors have keenly felt the lack of a text that might safely be recommended. Dr. Bridges has supplied us with a book that is not only authoritative but conservative and fair. What is more it is splendidly arranged and readable. No undue claims are put forward, but known facts and current theories are adequately presented.

The book is designed specifically for medical students and practitioners, and Dr. Bridges never misses an opportunity to link his subject with anatomy and physiology on the one hand and with the phenomena encountered in practice on the other. The sections on the various abnormalities of Attention, Sensation, Perception, etc., and the chapters on Personality and Psychopathology are of special interest.

In a book so uniformly good, one hesitates to even mention the very few discrepancies noted. One feels that the chapter on the Meaning of Abnormality might be shortened and a more extended reference to Conditioned Reflexes be supplied. "Thalami and corpus striatum" are mentioned several times when "Thalami and corpora striata" would be correct. The psychoanalysts will no doubt object to psychoanalysis being described as a process of questioning. Scots will boggle at a generalization concerning them mentioned on page 228. In discussing the theories of sleep, the question of a possible "sleep centre" is not mentioned.

These, after all, are defects of a very minor character and do nothing towards marring the opinion that this is a good book and one for which the need has long been evident. There is a good index and a useful bibliography properly classified is appended.

A. T. MATHERS

Notes on the Medical Treatment of Disease. For Students and Practitioners of Medicine. Robert Dawson Rudolf, C.B.E., M.D. (Edin.), F.R.C.P., Professor of Therapeutics, University of Toronto, etc. Third edition, price $4.00. University of Toronto Press, 1930.

This valuable book was first published in 1921. Just nine years after, it appears in the third, carefully revised, edition. The author remarks in the preface that "an earnest effort has been made to bring the work up to date and at the same time not to enlarge it. In spite of many changes in the way of deletions and additions the plan of the book remains essentially the same and is little larger."

The whole work is comprised under thirty chapters. The introductory chapter is an illuminating historic sketch of the development of various therapeutic systems. A good foundation for treatment is laid down in the chapter dealing with the management of the sick, a routine for which is outlined as follows: (1) diagnosis, (2) environment, (3) diet, (4) removal of the causes of the ailment, (5) symptomatic treatment. It is interesting to observe that in dealing with environment, the author discusses at some length the personality of the physician, giving most valuable advice to the profession.

Naturally, the greater part of the book is taken up with the treatment of infectious fevers, diseases of the respiratory system, the circulatory system, the digestive system and the nervous system, each system having four

or five chapters devoted to it. Diseases of the blood, of the kidneys, of metabolism, disorders of the ductless glands, the therapeutic uses of oxygen and the present position of venesection,—each is the heading of a chapter devoted to the subject.

If there is any criticism one might make on the subject matter of the work one may say that possibly too much attention has been given to the description and the diagnosis of disease, while on the other hand perhaps too brief discussion has been given to certain agents used in treatment, *e.g.*, water, and light, etc.

The book is well written and the fundamentals of treatment are clearly set forth. Intended as a readable up-to-date hand-book for the senior student and the young practitioner, the author's hope would seem to have been realized since three editions have been issued in so short a time. This edition may be even more strongly recommended than the second.

W. F. HAMILTON

Gastric and Duodenal Ulcer. Arthur F. Hurst, M.A., M.D., F.R.C.P., Senior Physician to Guy's Hospital, and Matthew J. Stewart, M.B., F.R.C.P., Professor of Pathology, University of Leeds. 544 pages, 159 illustrations. Price $19.00. London: Oxford University Press, Canadian Agents: McAinsh & Co. Ltd., Toronto, 1929.

This is a stately volume of five hundred and forty quarto pages, brought out by Humphry Milford of the Oxford University Press, apparently regardless of expense to publisher and author, and with an equal or even greater disregard of the buyer's pocket. The price of the book, in fact, is $19; and one can not refrain from wondering how far the late steady rise in the price of medical books is going to carry us. The French publishers are at present the only ones who show consideration for the purses of their clients. We are all paying de luxe prices for extra heavy paper, hand painted pictures, and a profusion of other illustrations. One might well imagine that the human intellect has reverted to the kindergarten level and can no longer understand the printed word without the help of accompanying pictures.

After these few words of pardonable annoyance, one may go on to say unreservedly that the book is a very full and excellent monograph upon the subject of gastric and duodenal ulcer. Dr. Hurst has long been known for his contributions in the domain of gastro-intestinal diseases, and Professor Stewart, who holds the Chair of Pathology in the University of Leeds, is quite admirable in his presentation of the pathology of these lesions. The very important radiological section is contributed by P. J. Briggs, of Guy's Hospital and the New Lodge Clinic. It is an excellent group of collaborators, and they have brought forth a work which will remain authoritative for many years to come.

The table of contents occupies nine pages. After a short historical introduction by Dr. Hurst, in which he corrects certain errors and gives credit where credit is due, there follow chapters upon the anatomy and physiology of the stomach, upon the etiology, pathogenesis and pathological anatomy of ulcer, upon the pathological physiology of the motor and secretory functions of the stomach, the whole occupying one hundred and forty-nine pages. Then come chapters upon the symptoms of acute and of chronic ulcer, upon the cause of pain and tenderness in ulcer, upon the somewhat mysterious subject of the quiescent period, and finally upon the proper mode of investigation of a suspected case of ulcer. The clinical history, the physical examination, the biochemical and roentgenological investigations are all taken up most fully and satisfactorily, and this section occupies nearly seventy pages. Then come three chapters upon differential diagnosis,—from nervous gastric disorders, from reflex dyspepsias, and from organic, gastric and duodenal disorders. The complications of ulcer are then fully discussed,—hæmorrhage, perforation, subdiaphragmatic abscess, fistulæ, pyloric and duodenal obstruction and hour-glass contraction of the stomach. These occupy a good hundred pages. The pathology of ulcer-cancer is then considered. The question of treatment is discussed under three headings, medical treatment, prevention of recurrence, and surgical treatment. A valuable chapter is added upon the ill results of operation for ulcer, such as non-healing, the new formation of jejunal ulcer, the mechanical troubles of obstruction, of the ill-placed stoma, and of adhesions, and so on. Finally the subject of jejunal and gastro-jejunal ulcers following operation is given a special chapter to itself, and the book ends with a few pages upon peptic ulcers of the œsophagus and tuberculous ulceration of the stomach and duodenum. There are thirty-six coloured plates over and above a large number of roentgenograms, half-tones, microphotographs. charts and line drawings.

The book is really exhaustive. The greater part of it is written by Dr. Hurst, whose long experience in this subject at Guy's Hospital, and more recently at the New Lodge Clinic, which we understand is a clinic for his private patients, entitles his opinions to the greatest respect. The literature both of America and Europe has been adequately studied, and his own cases have been thoroughly worked out. Practically every question which has exercised the minds of so many physicians and surgeons in this branch of our science is given full discussion, and in nearly all instances is made clearer by the author's well-digested experience and original studies.

It would be difficult within the limits of a review to refer to more than a few of the many excellencies of the book. In the chapter on the anatomy he disputes the importance of Waldeyer and Aschoff's "Magenstrasse," the four road boulevard running from the cardia to the pylorus along the lesser curvature. The whole theory of the acid control of the pylorus, as regards opening and closing, he considers as disproved. As to pathogenesis, he agrees that all chronic ulcers begin as acute ulcers. He considers, in agreement with the best modern work, that both the acid and the infective factors are necessary in the causation of ulcer. He seems to believe that infection often reaches the duodenum through the lymph stream from the appendix, adopting in this method the opinions of those surgeons whose enthusiasm for "living pathology" clouds their intellects and upsets their critical faculties. The facts concerning lymphatics and lymph flow do not justify any such assumption, and *post hoc*, or even *cum hoc*, does not in this problem mean *propter hoc*.

The chapter on the medical treatment of ulcer is particularly full; indeed it is magisterial. Dr. Hurst makes with great emphasis two statements: that the medical treatment of ulcer is commonly slipshod, inadequate; and that *adequate* treatment will cure the vast majority of ulcers. Rigid treatment, he says, should be continued, if necessary, for as long as eight weeks, and should be supplemented by a strict "post-ulcer régime", until occult blood disappears from the stools and x-ray examination shows a return to the normal picture. His argument against the prevailing tendency towards a too facile recourse to surgery is well sustained, convincingly expressed, and supported by a wealth of experience analysed to the last detail. Nevertheless, his discussion of the surgical treatment is eminently fair, and his conclusions concerning the indications for operation and the choice of operation, are in the author's opinion (that of a surgeon) thoroughly sound. The surgical world is perhaps in need of some such tightening of the rein.

All in all, the book is an acquisition to medical literature; it is a credit to English medicine; and it is to be recommended alike to internist, surgeon, and general practitioner. E. W. ARCHIBALD

Applied Physiology. Samson Wright, M.D., M.R.C.P., Lecturer in Physiology, University of London, King's College. Third edition. 552 pages, illustrated. Price $5.00. London: Oxford University Press. Canadian Agents: McAinsh & Co., Ltd., Toronto, 1929.

The hiatus between the standard text-book of physiology and recent work on the subject is extremely difficult to bridge. Dr. Wright has succeeded not only in doing this Herculean task but at the same time has shown the value of recent physiological discoveries to clinical medicine and surgery. The appearance of a third edition within fifteen months of the second is ample testimony of the usefulness of the book.

The sections devoted to the nervous system are well written and contain much valuable information on the trend of research in neuro-physiology. The vast amount of literature on the ductless glands, tissue extracts, and the hormones of the sex glands has been condensed and presented in a form which will appeal not only to the clinician but to the student of physiology.

The book pre-supposes a fair knowledge of physiology and for this reason it should commend itself to those who wish to apply more directly modern physiology to bed-side medicine. As a subsidiary text-book for students preparing for the primary fellowship examinations of the Royal College of Surgeons, it can be confidently recommended. JOHN BEATTIE

The Right Honourable Sir Thomas Clifford Allbutt; A Memoir by Sir Humphry Davy Rolleston, Bart., G.C.V.O., K.C.B. VI and 314 pages; three illustrations. Price, $4.50. London, the Macmillan Co., Limited; Toronto, the Macmillan Co. of Canada, 1929.

It may be yet too soon to anticipate the verdict of posterity as to the place of Sir Clifford Allbutt in the hierarchy of medicine, for he has been dead little more than five years. Nevertheless, those who read this book will, we are sure, agree that we have here a sympathetic account of a great and good man. Sir Clifford Allbutt was an original thinker and observer, and, withal, endowed with the practical common sense of his race. A mere enumeration of his chief contributions to medical science is sufficient to establish his title to fame. He invented the short clinical thermometer. He introduced into England the operation of paracentesis of the chest for intrathoracic and pericardial effusions, which he had seen practised in the clinic of Trousseau at Paris. In 1867 he gave the first description of the histological changes in syphilis of the cerebral arteries. He wrote an epoch-making work on "The use of the ophthalmoscope in diseases of the nervous system and of the kidney, and also in certain general diseases" (1871). He was the first to publish the view that general paresis of the insane is a manifestation of syphilis. In the late seventies he advocated the out-door treatment of tuberculosis. He recognized that in tetanus the infection passed up the nerve trunks to the cord, and advocated neurotomy in this disease. He taught the aortic origin of angina pectoris. The subject of cardiovascular disease, particularly hyperpiesis, he made peculiarly his own. And his great System of Medicine is known to all. With all this, Sir Clifford found time to write extensively on the history of medicine, and interest himself in the great social and intellectual movements of his day. As a writer his style was correct, dignified, and effective. As a speaker his style was easy and delightful, as those who were fortunate enough to hear him very well know.

The memory of Sir Clifford Allbutt is safe in the hands of his biographer. Sir Humphry Rolleston, Sir Clifford's successor as Regius Professor of Physic at Cambridge, and collaborator in the later editions of the System, was eminently qualified for his task. In the preface Sir Humphry refers to the saying that "it is as difficult to write as to live a good life," and, further, comments on the lack of full materials for his purpose. Nevertheless, from the statements of contemporaries and from medical and other journals, he has been able to piece together a coherent and absorbing story, which actually indicates, as he hoped it might do, the "wonderfully consistent energy, versatility, wide sympathies, and scholarly culture of this leader of his profession." Indeed, the very soul of the man stands out. The volume is a small one, as books go nowadays, but one could well wish it were twice as big. The story is well told and worthy of its subject. Most of those who read it will put the book down with a tinge of regret at their own inadequacy, for truly "There were giants in those days." Every medical practitioner, and every medical student will do well to read this book. This is a duty and will be a pleasure, for the life of Sir Clifford Allbutt is at once an inspiration and a challenge.

A. G. NICHOLLS

Die Medizin der Gegenwart in Selbstdarstellungen. (Einhorn, Faber, Küstner, Rieger, Unna). Edited by Prof. Dr. L. R. Grote, Chefarzt der C. von Noorden-Klinik, Frankfurt a.M. Der ganzen Reihe achter Band. 219 pages. Price, linen, 12 Marks. Publishers: Felix Meiner, Leipzig, 1929.

This volume is the eighth of a series dealing with autobiographies of living, distinguished clinicians and scientific investigators. Its contributors are Max Einhorn (New York), Knud Faber (Copenhagen), Otto Küstner, Konrad Rieger and Paul Unna. The arrangement of these contributions is somewhat similar. They deal with the personal history of the writer and then his scientific work. Both sides are well balanced, with a proper and greater regard to the scientific side and career than to purely personal matters. This is to be commended. The purpose of the book is to furnish, not so much the personal histories of these men as an account of contemporary medical development. The personal approach offers a unique additional feature for it informs us of the mental attitude which each writer has towards medicine as a whole, his subject, and its investigations. Thus, also, it gives us their views and experiences as regards educational matters.

It would be difficult to compare these biographies with each other for each presents quite a standpoint of its own. But there are one or two interesting points in comparing them as regards individual development and direction of their mind during their early years of study. Each one mentions as particular stimulus the advantages of pathological training. Küstner expresses it most positively thus: "The finest course which I believe I ever attended was Virchow's demonstration course. As heterogeneous as his subject matter may have been to my own inclinations (he became a gynæcologist and obstetrician) it was Virchow's demonstrative courses which gave me direction for my own clinical teaching and really served as a model for me." Very instructive and illuminating is Rieger's autobiography, for it not only is an account of his own life and work but contains so many stimulating, reflecting excursions and philosophical considerations that it is a real pleasure and intellectual gain to read it.

The book fulfils the purpose of the editor, "to furnish a collection of contemporary and past history which illustrates the development of modern medicine." The fact that it is written in the form of autobiographies makes it a more concrete presentation with a personal charm which the ordinary historical accounts generally lack. HORST OERTEL

Textbook of the Practice of Medicine. By various authors. Edited by Frederick W. Price, M.D., F.R.S. (Edin.). Consulting physician to the Royal Northern Hospital, etc. Third edition, 1871 pages. Price $10.00. Oxford University Press, London; McAinsh & Co., Toronto, 1929.

The popularity of this work is attested in the appearance of this third edition, with five extra printings of the editions since its first publication in 1922. Many new articles have been added, new matter appears in many others, and a goodly number have been rewritten. By using thin paper the 1871 pages are still presented in one volume of moderate size. The value of the book for ready reference is enhanced by a comprehensive index of over 110 pages. The volume is a credit to the editor, his collaborators, and the London School of Medicine, all of whom must be gratified by the reception it has been given by teachers, students and the profession in general. J. H. ELLIOTT

Gallensekretion und Gallenentleerung. Klinisch-experimentelle Untersuchungen. D. Adlerssberg. IV and 76 pages; Franz Deuticke, Leipzig und Wien, 1929.

As the subtitle of this little book indicates, it is not a monograph on secretion and discharge of bile, but a review of work performed chiefly by the author and his co-workers on certain problems in connection with the function of the liver. The book is divided into two parts; (1) secretion of bile, and (2) discharge of bile into the duodenum. These two functions are considered as separate phenomena, which is in accordance with modern physiological views. The work was performed partly on animals (rabbits under urethane), partly on normal persons and patients with different diseases (with the duodenal tube).

Secretion of bile.—Dehydrocholic acid (its sodium salt is the least toxic preparation of cholic acid) introduced intravenously inhibits the excretion in the rabbit of bilirubin, methylviolet, congo red and sodium iodide. It does not affect the excretion of sugar by the liver after an injection of phlorhizin. The injection of dehydrocholic acid, which augments the secretion of bile (cholerese), increases the concentration of bilirubin in the bile, diminishes the content of cholesterine in blood serum, increases in most cases (normal and pathological) the diuresis, and diminishes the content of bilirubin in the urine. Pituitrin inhibits the secretion of bile (rabbit). The narcotics which act on the cerebral cortex (urethane) have no influence on the inhibitory action of pituitrin. Those which act on the brain-stem (chloreton, luminal) diminish the inhibitory effect of pituitrin on bile secretion. In man the inhibitory effect of pituitrin on the secretion is often obscured by the discharge of bile from the gall-bladder.

Discharge of bile (cholekinese).—No evacuation of the bile from the gall-bladder could be noted in rabbits under urethane after administration of pituitrin. In man, pituitrin (2 c.c. of 10 per cent "pituisan" subcutaneously) is a strong cholekinetic. Most uncertain and incomplete discharge of the gall-bladder bile is observed after introduction into the duodenum of magnesium sulphate. Pituitrin is much more effective. The strongest and most constant effect is observed after the injection of olive oil into the duodenum. Since the "pituitrin reflex" was inhibited by narcotics acting on the brain-stem (*e.g.*, chloretone) and could not be produced in some cases of Parkinson's disease, whereas the "magnesium sulphate reflex" was not affected, and was obtained in the above-mentioned patients, the author thinks that the "magnesium sulphate reflex" is discharged through the short reflex paths from the duodenum to the gall bladder and the path of the "pituitrin reflex" passes through the brain-stem. The diagnostic value of the changes in the bile after injection of decholin are discussed, and the therapeutic use of dehydrocholic acid is discussed in the last chapters of the book. B. P. BABKIN

A Shorter Surgery. R. J. McNeill Love, M.B., M.S. (Lond.), F.R.C.S. (Eng.) Second edition. 371 pages, 74 illustrations, including 31 plates. Price 16/- net. H. K. Lewis & Co., London, 1930.

In this edition chapters on dislocation, fractures and specific diseases have been added.

The chapters devoted to diseases of bones and joints are particularly well illustrated. Some subjects, *e.g.*, duodenal ulcer, appear to be rather hurriedly discussed.

The classifications given will appeal to the student in surgery. To such an individual, especially in preparation for examination, this book will be of definite value. STUART D. GORDON

Urologie Pratique. Dr. P. Bazy. 536 pages, illustrated. Price, 80 fr. Gauthier-Villars & Co., Paris, 1930.

This book is apparently a revision of an earlier work, though the dates of neither the original publication nor the revised edition are given, and contains 467 pages of reading matter. A few pages are devoted to anatomical considerations, 211 to methods of urological examination and treatment, and the major portion, or 242 pages, to symptomatology, or, as the French call it, semeiology.

Too often the practitioner, for whose use the book purports to be written, meeting a case with symptoms pointing to disease in the urinary tract, does not study sufficiently carefully those symptoms, and in particular does not utilize simple methods of examination, methods which are quite within his powers. Bazy's book is to be commended for the clear manner in which both of these essential points are dealt with. Text-books in English pay too little attention to symptomatology in the abstract. French books have always excelled in this respect, and this book is no exception.

In some minor details the work is lacking. For example, the cystoscopes in common use on this side of the water are in our opinion superior to those illustrated in the text. The Ambard test of renal function has not found favour outside of spheres of French influence. Urography is not given the prominence it deserves as a diagnostic measure. Pyelography is mentioned only twice; ureterography and cystography not at all.

Typographically, the book is excellent, though one may criticize the continental habit of publishing in paper covers. Before our copy had been barely scanned it was almost disintegrated. The book makes easy and pleasant reading. The French are noted for their clinical lectures, which can transform the dry bones of didactic teaching into lucid, and agreeable narrative. Dr. Bazy's book has all the charm of that form of medical literature. F. S. PATCH

Otologic Surgery. Samuel J. Kopetzky, M.D., F.A.C.S. Second (revised) edition. 553 pages, 104 illustrations. Price $8.00. Paul B. Hoeber, Inc., New York, 1930.

This volume is of convenient size, contains 533 pages of bold clear type and is profusely illustrated.

A copious list of references is given at the end of each chapter which adds greatly to the value of the work as a book of reference. In the preface to the first edition, the author stresses a thorough knowledge of pathology and this is strongly emphasized throughout. The book is a mine of information and has been brought entirely up to date. The chapters on the surgery of the meninges and the surgery of otitic brain abscess are particularly interesting. There is an excellent description of Dr. J. E. J. King's treatment of brain abscess by "unroofing the abscess and allowing temporary herniation." This book should be read by every prac-

titioner and otologist, if only for the indications, technique, and limitations of paracentesis.

J. H. JOHNSON

Hemorrhoids—The Injection Treatment and Pruritis Ani. Lawrence Goldbacher, M.D. 205 pages, illustrated. Price $3.80. F. A. Davis Company, Philadelphia, 1930.

In this short monograph Goldbacker presents his own method of treating hæmorrhoids. The method does not differ from the treatment advocated by Montague, Terrell, Fenn, Shuford, Yount, H. Graeme Anderson, Tuttle and many others. Goldbacker uses a 5 per cent phenol solution in Wesson or cottonseed oil, and confines the treatment to uncomplicated internal hæmorrhoids. External hæmorrhoids are not treated by the injection treatment. He follows the technique used by other surgeons.

His treatment of pruritus ani is new. There are many causes of pruritus ani, and rectal conditions including hæmorrhoids stand out in greater proportion than any others. Goldbacker, with this in mind, applies the same treatment for hæmorrhoids to pruritus ani. He injects 5 to 10 c.c. of 5 per cent phenolized oil deeply into the perianal tissues beneath the areas of more intense itching. The treatment is repeated at 5-day intervals. He reports many cures after three or four injections. This treatment is well worthy of attention. He advises that all hæmorrhoidal conditions be cleared up first. Pruritus ani is one of the most aggravating of conditions, and resists many forms of treatment. A prompt termination of such a condition is offered by the injection treatment.

A review of the literature on the injection treatment of hæmorrhoids reveals that carbolic acid is the basic drug of most successful formulæ. It is used in varying percentages by different surgeons. Goldbacker advises that a 5 per cent phenol solution is sufficiently strong enough to get results. Solutions of over 20 per cent naturally need very exacting technique, and to the beginner the 5 per cent phenol solution offers a wider margin of safety.

This book is an outgrowth of two articles by Goldbacker appearing in the *Medical World*, 1929, and *American Medicine*, 1929. The question arises whether any article appearing in any of the medical or surgical journals possesses enough merit to receive the honour of being published in book form. The development of magazine articles into book form calls for considerable padding and this book suffers on that account. The subject material is offered in synopsized form, so that one who runs may read; but it is not attractive and does not leave you with any lasting impression. Illustrations are needlessly enlarged to fill whole pages. Five pages could easily have handled the 26 illustrations, and there are 37 blank pages in the book, showing a waste of 58 pages. Goldbacker has added nothing new to the literature on the injection treatment of hæmorrhoids. He has offered a new treatment for pruritus ani, which is the only redeeming feature of the book.

HUGH M. YOUNG

Radium in General Practice. A. James Larkin, B.Sc., M.D., D.N.B., Radium Consultant on Staff of Wesley Memorial, etc. 304 pages, 28 illustrations. Price $6.00. Paul B. Hoeber, Inc., New York, 1930.

The object of this treatise on radium, as expressed by the author in the preface, is to assemble reliable data as to the therapeutic possibilities of radium, so that the general practitioner may be enabled to weigh their value with other available methods of treatment. It is also hoped that it may help to combat propaganda against so valuable an agent. The data for the work were obtained from numerous reports as well as from the author's personal experience.

The opening chapter deals rather briefly with the biological reactions of radium, the general technique of application, and with the dangers of radium when poorly applied or carelessly handled. The remaining four sections deal with the indications, method of application, reaction, and prognosis in lesions which may be treated by this substance. The lesions so treated fall under four heads: (1) General diseases, such as leukæmia; (2) gynæcological diseases, as carcinoma of the cervix, urethral caruncle, uterine bleeding, polyps, etc.; (3) miscellaneous tumours and carcinomas, as breast cancer, epulis, epithelioma of the lip, carcinoma of the rectum, sarcoma, etc.; (4) skin conditions.

The book is clearly and carefully written, and deals with practically every condition in which radium may be used. The section on skin conditions, which is apparently the author's own field, is especially complete and concise. One wonders whether the long pages on dosage and method of application are either necessary or advisable in a book written for practitioners, who will not themselves be carrying out the treatment.

As a summary of all the possible indications and uses of radium, and the reaction to be expected after its application, the book ought to be quite useful.

ELEANOR PERCIVAL

A System of Bacteriology in Relation to Medicine. C. H. Browning, W. Bullock, etc. Vols. 2 and 4. 420 pages. £1.13 each. London: Published by His Majesty's Stationery Office, 1929.

These two volumes deal more particularly with the pathogenic bacteria of the temperate climates. Special reference is made to the staphylococcus, streptococcus, typhoid and pneumococcus groups, and also the more common spirochætes. The authors give a comprehensive review of the present knowledge regarding these bacteria, as to history, cultural characteristics, and strains of various virulence and pathogenicity.

The grouping of the pneumococcus and the use of serum in the treatment of pneumonia are very carefully and logically discussed.

The work is based on known facts entirely, without theorizing.

If the two volumes just issued indicate the quality of its system as a whole, it is a work which will be most valuable for reference, in medical laboratories and libraries.

A. H. MACCORDICK

Man's Place Among the Mammals. F. Wood Jones, F.R.S. London. Edward Arnold & Co. 1929.

The "unorthodox" opinions of Professor Wood Jones on the course of human evolution have attracted considerable attention since the publication of his "Arboreal Man" many years ago. This new book summarizes his viewpoint and presents his case in a manner which is both refreshing and forcible. No matter how much or how little one may disagree with him in his thesis, one is forced to admit that he has rendered necessary a complete review of the whole field of the comparative anatomy of the primates.

The orthodox viewpoint that the human branch of the primate family "differentiated off" from a stem common to it and the anthropoid apes is assailed by the author. He has brought forward evidence which he has interpreted as meaning that the human family never passed through a "simian" phase of evolution but was segregated off before such simian specializations appeared. His contention is that once "simian" features appeared in the primate phylum animals possessing these features differentiated into the apes and Old World monkeys and not into apes, Old World monkeys and man.

It is a great pity that he did not take into consideration the work of Thornton Carter on the structure of the enamel in the teeth of primates. Professor J. P. Hill's Croonian Lecture on "Primate placentation"

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WANTED—Anyone wishing to dispose of Canadian journals or hospital reports, especially old volumes, please communicate with the Medical Library, McGill University, 3640 University Street, Montreal.

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came to late for Wood Jones to incorporate it into his book. It is likely that he might have modified some of his statements had these two pieces of research been available.

To students of human anatomy and to those who have not lost interest in human structure in an age worshipping at the shrines of physiology and biochemistry, this book will have a great appeal. One should like to compel those writers who scribble remuneratively and at length on human evolution to "read, mark, learn and inwardly digest" this volume.

JOHN BEATTIE

Diseases Transmitted from Animals to Man. Thomas G. Hull. 352 pages, 29 illustrations, 43 tables. Price, $5.50 postpaid. Baltimore: Charles C. Thomas, 1929.

This is one of the best books that has come to our notice for some time. Its appeal is not so much in the inclusion of any new material as in the presentation of the old. There is within its compass most of the information required by public health workers regarding the diseases transmitted from animals to man.

The material is assembled under five sections. Each disease is discussed under the headings, History, Prevalence, Infectious agent, the Disease in Animals, the Disease in Man, Prevention and Control. The discussion of each disease is closed with a short summary containing Items of Note, and a very complete bibliography is conveniently placed at the end. The chapter on tuberculosis is good, especially that portion devoted to avian and swine tuberculosis. Food poisoning is dealt with in a very satisfactory manner; the rather complicated question of the nomenclature of the organisms causing food infections is much clarified and simplified.

It will not detract from the general excellence of the book to mention a few inaccuracies noted. In treating of the subject of botulism, it is not definite enough to say the spores of clostridium botulinum are killed by "heat at boiling temperature for several hours"; the exact time required (which is more than several hours) should be given. The author is not in agreement with most authorities when he states the fixed virus of rabies is destroyed in thirty minutes by a 5 per cent solution of phenol. It is generally accepted that the coal tar products are not effective disinfectants of the filterable viruses.

In presenting the subject of Malta fever and contagious abortion, the writer says "no cases of abortion in women are recorded". This is not in accordance with the report of Kristensen and Holm who record the cases of three pregnant women suffering from abortus fever who aborted, and in one of these cases Brucella abortus was recovered from the placenta. (*Centralbl. f. Bakt.* **112:** 281, May 28, 1929).

This volume can be highly recommended to health officers, veterinarians, teachers in medical schools, students, and public health workers.

R. ST.J. MACDONALD

The Penicillia. Charles Thom, Principal Mycologist, U.S. Dept. of Agriculture, assisted by Margaret B. Church, O. E. May, and M. A. Raines. 643 pages, illustrated. Price $10.00. Williams & Wilkins Co., Baltimore, 1930.

"Of the making of many books there is no end," which may be paraphrased here by saying that of the making of a book on penicillium there is no end, or at least the end is not within easy sight. These small organisms in the aggregate constitute a large subject for enquiry. To the "unpenicillium conscious" the group offers great difficulties of study, and important as the penicillia are in various fields of human activity and interest, our exact knowledge of them is still deficient in a remarkable degree. To dispel this darkness, the author, Dr. Charles Thom, with the assistance of several collaborators, has made an enormous effort, for the total number of species, not all penicillia, but including allied genera, runs to 678, and of course the end is not yet. In addition to lengthy and critical descriptions, the book is compendious, in that it treats fully also of the history, methods of study, biochemistry, significance in nature, industry and medicine. The last named item is of special interest to the readers of these columns. The chapter dealing therewith presents summary memoranda, apparently exhaustive, so far as the reviewer can judge, but which may be and probably are incomplete, without intending aspersions on the authors. It shows clearly that the clinical reports dealing with the penicillia and its related kinds are very scattered and inaccurate, and there is evidently much work to be done. Here is an opportunity for young investigators with a flair for research in a botanico-medical field, The book will be needed as a general reference on account of its plenitude of information. F. E. LLOYD

BOOKS RECEIVED

Nasal Catarrh. W. Stuart-Low, F.R.C.S., Consulting Surgeon to the Central London Throat, Nose and Ear Hospital, etc. 94 pages, 13 illustrations. Price 5/- net. H. K. Lewis & Co. Ltd., London, 1930.

Normal Facts in Diagnosis. M. Coleman Harris, M.D., Lecturer on Physical Diagnosis, New York Homeopathic Medical College and Flower Hospital, etc., and Benjamin Finesilver, M.D., Lecturer on Diseases of the Nervous System, New York Homeopathic Medical College and Flower Hospital, etc. 247 pages, 42 illustrations. Price $2.50. Philadelphia: F. A. Davis Co., Toronto: Macmillan Co. of Canada, 1930.

Physiology of Oral Hygiene and Recent Research. J. Sim Wallace, D.Sc., M.D., L.D.S., Lecturer on Preventive Dentistry, King's College Hospital. Second edition. 235 pages, illustrated. Price 10/6 net. Baillière, Tindall & Cox, Covent Garden, London, 1929.

The Soya Bean and the New Soya Flour. C. J. Ferrée. Revised translation from the Dutch by C. J. Ferrée and J. T. Tussaud. 79 pages, illustrated. Price 6s. net. William Heinemann, Ltd., London, 1929.

Surgical Clinics of North America. Vol. 10, No. 1, February, 1930. Price $13.50 for set of six. London and Philadephia: W. B. Saunders Co.; Toronto: McAinsh & Co., 1930.